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ABSTRACT

This investigation was designed to explore the differences between 6th grade underachievers, average achievers, and overachievers in reading in their later achievement and behavior and to compare relationships to reading achievement that occur for students with high socio-economic status (SES) background and low SES background, and students with high IQ scores and low IQ scores. The purpose of dividing the sample into subgroups based on the major variables of IQ, SES, race and sex was to determine whether the effects of underachievement in reading were modified in groups differing in these characteristics. Differences that were found were small and generally overshadowed by the consistent pattern reflected in all groups: i.e., underachievers in the 6th grade performed at a lower level than average achievers on standardized tests, course marks, and other measures of achievement all through secondary school. Included is the supplement to Part Two and Part Three. See Part One [ED 034 660], and Part Three [CS 000 079]. (Author/WR)

Reading Achievement and Its Relationship to Academic Performance

Part II:

Relationships of Reading Achievement in Race, Sex, Socio-economic, and Mental Ability Groups

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Laboratory Paper #28
Personal and Social Organization Section
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Relationships of Reading Achievement in Race, Sex, Socio-economic, and Mental Ability Groups

Dee Norman Lloyd[1]

Many studies have established that mental ability, as measured by group or individual intelligence tests, is positively related to achievement. Also, in studies where socio-economic status (SES) has been related to general achievement and in studies where groups of underachievers and average achievers have been compared, relationships between educational and occupational background of students and achievement level have been found (Frankel, 1960; Lavin, 1965; Newton, 1959; Engle, 1967; and Chopra, 1967). The majority of studies on underachievers in the literature have used only subjects in the above-average mental ability range. The most common approach has also been to control differences in IQ or SES level by matching subjects on one or the other of these variables. The present investigation was designed to explore the differences between 6th grade underachievers, average achievers, and overachievers in reading in their later achievement and behavior and to compare relationships to reading achievement that occur for (1) students with high SES background and low SES background, and (2) students with high IQ scores

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[1]The author is director of Project MHSC-1, Antecedents of Educational Achievement, of which this study is a part. Appreciation is expressed to the many who have contributed to the project in the collection and coding of the data. Special appreciation is expressed to Mrs. Anita Green, Project Statistical Assistant, Miss Janet Modery, Project Secretary, and Mr. Michael Gold & Mrs. Gail Bleach, Project Clerks, for their contributions to the present study. We also wish to thank the personnel of the County Board of Education who have contributed so much to making the project possible.

and low IQ scores. Comparison of achievement groups within the different strata of SES and IQ was directed at determining whether problems of underachievers in these groups differ, and whether the general detrimental effect of underachievement in reading on later academic performance that was found in the total sample (Part I of this report) is modified by SES background or general mental ability.

Results of these comparisons may have implications for remedial programs and general instructional programs by indicating how important it is to take general mental ability or socio-economic level into account when attempting to assess underachievement in reading, predict its consequences, or remedy reading deficiency problems, generally, or in specific subpopulations such as the socially disadvantaged.

Separate analyses of the achievement groups were also conducted within the four race-by-sex samples that comprised the study population. The purpose of these analyses was to compare the differential relationships of reading achievement in these groups, rather than differences in performance across these groups per se. Previous analyses with these data (Lloyd, 1967a; Lloyd, 1967b) have shown significant differences in level of performance across both race and sex samples, and these have generally been in close agreement with differences found by other investigators. As a group, girls obtained higher scores on standardized tests, higher marks and grade point averages, were retained fewer times in elementary school, and had a lower dropout rate than boys. The majority of these differences

were replicated across race. Differences between Negro and white students in test performance and socio-economic background were also similar to those reported by other investigators (Dreger & Miller, 1960; Deutsch, 1960; Kennedy, Van de Riet, & White, 1963; Stetler, 1959). The socio-economic status of the Negro students was primarily concentrated in the two lowest levels of the five-level SES index, their mean 6th grade IQ score was 87 in contrast to a mean score of 104 for whites, their mean achievement test performance was one grade below grade placement in the 6th grade and had dropped from a mean performance that was at grade level in the 3rd grade. Elementary school retentions and dropout rate were also greater in the Negro samples than in the white samples. Given these differences, the questions for investigation concerned whether the samples differed in regard to prevalence of underachievement in reading, relative to measured level of mental ability, and whether they differed in the relationship of underachievement in elementary school to later academic performance.

Method

Subjects

Subjects were 3651 6th grade students who had scores on both the IQ score and reading score that were used to define reading achievement groups. This sample was stratified (1) into high and low SES levels, and (2) into high and low IQ levels. In the 6th grade, the high SES group consisted of 1487 subjects; the low SES

group, 1971 subjects. In the high IQ group there were 2157 subjects; in the low IQ group, 1494 subjects. Analyses were also performed with the individual race and sex samples that together made up the combined sample. These samples consisted of 1624 white males, 1600 white females, 231 Negro males, and 196 Negro females.

The number of subjects with data on later measures of achievement varied because of loss of subjects from the cohort through transfer or dropout and from the exclusion of subjects with missing information in the comparisons. Analyses on the relationship to high school dropout or graduation were limited to subjects known to have dropped out or graduated, eliminating transfers, whose ultimate outcome was indeterminate.

Variables

With few exceptions, the variables analyzed were the same as those described in Part 1 of the report. The score indicating discrepancy between predicted and obtained reading was derived from the regression of the IQ score of the California Test of Mental Maturity (CTMM IQ score) and the California Achievement Test Total Reading score (CAT Reading score), both administered in the 6th grade.

Stratification of the sample into high and low IQ levels was done on the basis of the 6th grade CTMM IQ score. Stratification into high and low socio-economic status levels (SES) was made according to the Hollingshead Two-Factor Index of Social Position (Hollingshead, 1957). This index consisted of a weighted composite of the occupational and educational levels (occupation weighted 7

and education weighted 4) of the subject's father as it was recorded in the school records when the subject was in the 6th grade.[2] The index consisted of five levels, with level 1 reflecting the highest educational and occupational background.

Dependent variables were classified as measures concurrent to the classification of subjects into reading achievement groups, measures of later academic performance, and measures of later behavior and outcome. Concurrent achievement measures were 6th grade language and arithmetic subtest scores of the CAT Battery and the grade point average for the 6th grade courses.

Measures of later academic performance consisted of yearly grade point averages, grades 7 through 12, grade point averages in specific course areas averaged over the years in which a subject was in school, and performance on standardized tests administered in the 7th and 9th grades.

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[2] In cases where information on the father's educational and occupational status was not available, or if the father was not living with the family, the index was computed from the education and occupation of the mother. Educational level was coded into three categories: elementary, high school, and beyond high school; coded 6, 4, and 1, respectively, in order to compute the Hollingshead Two-Factor Index of Social Position. The occupational level of the father consisted of a seven-category scale adapted from the occupational scale of the Index of Social Position (Hollingshead and Redlich, 1958). A summary of the seven occupational levels in this scale is as follows:

Level 1: Higher executives, proprietors, and professionals
Level 2: Lesser executives, proprietors, and professionals
Level 3: Administrative, small business owners, minor and semi-professionals
Level 4: Clerical, sales, and technicians
Level 5: Skilled trades
Level 6: Semi-skilled trades
Level 7: Unskilled workers

The yearly grade point averages were the average of the final marks in courses receiving a full unit credit (mathematics, English, science, social studies, and foreign languages).[3]

Course-area grade point averages were calculated for 10 course areas: English, social studies, science, mathematics, business, vocational, foreign languages, art, physical education, and music.[4]

In calculating both types of grade point averages, course marks were assigned codes ranging from 5, for a mark of A, to 1, for a mark of E.

The standardized test scores were the reading average, arithmetic average, and language subtest scores from the Stanford Achievement Test (SAT) administered in the 7th grade, the reading average from the SAT administered in the 9th grade, and all of the subtests from

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[3]For subjects withdrawing during the second semester of a year, the available marks for that year were averaged. Where a complete grade or certain courses were repeated because of failures, only the repeated course marks were included in the average. If a subject failed the same course twice and did not repeat it, the last failure, or mark of E, was counted in the average. In effect, this method of calculating the average made these variables measures of the best performance of a student in the more academic subjects at each grade level. Yearly grade point averages were based on a reduced sample of subjects at each successive grade level.

[4]Courses in speech, dramatics, and journalism were included in the English area; history, geography, and psychology in the social studies area, etc. The course area grade point averages were available for all subjects except those who transferred or dropped out in the 7th grade. The number of courses on which the average was based, however, differed among subjects. For the required courses, averages were available for approximately 3300 subjects; lower numbers of subjects had averages in elective courses.

the Iowa Test of Educational Development (ITED) administered in the 9th grade.[5]

Behavioral and outcome measures were the number of school activities participated in for grades 7 through 10, the number of absences in grades 7 through 12, dropout or graduation from high school, and employment or college attendance following high school graduation.

Procedures

In general, procedures were the same as those followed in the analysis of the combined samples (Part I). A discrepancy score that represented the difference between subjects' expected reading level and obtained reading level in the 6th grade was calculated. The reading discrepancy scores were derived from the regression of the IQ score and the reading score within each of the four race-by-sex samples. Three achievement groups were formed on the basis of the standard deviation of the discrepancy in each sample. This standard deviation was equivalent to the standard error of estimate (S.E.E.) for predicting the 6th grade CAT Reading score from the 6th grade CTMM IQ score. Underachievers had discrepancy scores below 1 S.E.E.; average achievers had discrepancy scores between + or - 1 S.E.E.; and overachievers had discrepancy scores above 1 S.E.E. The S.E.E.'s in the four race and sex samples were similar

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[5] Grade equivalent scores were coded for SAT tests. For the ITED tests standard scores were used.

enough in size to allow the same cut-off score to be used in defining the achievement groups (the mean discrepancy score + or - .85). Only in the Negro female sample, where the S.E.E. was .768, did this procedure affect the classification of subjects into achievement groups. Because of the slightly smaller S.E.E. in this sample, slightly fewer subjects were classified as underachievers and over-achievers by using the cut-off point of .85.[6] The achievement groups can also be described in terms of two other commonly-used units for describing achievement. First, in a normalized distribution, under-achievers had a reading score two or more stanines below the score expected on the basis of mental ability. Second, since the discrepancy score was in grade equivalent units, underachievers were reading .9 grades or more below the level predicted on the basis of 6th grade IQ score.

In order to investigate the relationship of reading achievement to other performance measures at different levels of mental ability, two groups were formed on the basis of scores on the 6th grade CTMM. The high IQ level consisted of subjects with 6th grade CTMM IQ scores of 100 and above; the low IQ level consisted of subjects with scores below 100. For comparison of reading achievement in groups

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[6]Discrepancy scores were rounded to one-tenth of a grade-equivalent score so that subjects with a score of -.9 or below were classified as underachievers and subjects with scores of +.9 or above were classified as overachievers. Four Negro females had scores of -.8 and would have been classified as underachievers by the S.E.E. in that sample, but were classified as average achievers for this analysis. One Negro female had a score of +.8 and was classified as an average achiever rather than as an overachiever.

of different socio-economic status background, subjects were classified into two SES levels. The high SES level consisted of students whose parents were in levels 1, 2, and 3 of the two-factor index of social position; the low SES level consisted of subjects in levels 4 and 5 of the index.[7]

Achievement groups were not matched on SES level. The method of defining achievement groups, however, did result in their being matched in mean IQ level in the combined samples. Differences on these measures within high and low stratifications and race-by-sex samples were assessed and are reported in the Results section.

The relationships of variables to reading achievement were assessed by mean difference tests across the three achievement groups or by cross-tabulation of frequencies across the three groups, with respective F tests and chi squares to determine the level of significant differences. In connection with analysis of

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[7] The comparisons of high and low SES and IQ levels are reported for the combined samples, i.e., the underachievers, average achievers, and overachievers in all four race and sex samples. Since the majority of Negro subjects had IQ scores below 100 and were concentrated in the lower SES levels, most Negro subjects were included in the lower levels of these stratifications. Comparisons of high and low IQ and SES groups within the separate race-by-sex samples were made to determine possible interaction effects and to pinpoint specific subgroups contributing to significant differences across achievement groups. For these analyses, high and low IQ and SES were defined in the Negro samples to achieve a more balanced comparison. High and low IQ levels were defined as an IQ score of 86 and above and 85 and below, respectively. High SES was defined as levels 1 through 4 of the two-factor index; low SES consisted of level 5. These data will be referred to only when they add to or contradict the results obtained from stratifications in the combined samples.

variance comparisons, the omega^2 statistic was calculated to evaluate the degree of association between achievement groups and the dependent variables and to evaluate the relative strength of relationships to the achievement classification of different variables.[8]

Results

Distribution of Reading, IQ, and SES Scores in Samples and Stratifications

In Table 1, the mean performance on the 6th grade standardized tests is presented for the combined samples, the four race-by-sex samples, and the high and low SES and IQ groups. The mean IQ of the white samples was slightly higher than that of the standardization sample (103 for white males; 106 for white females). The mean IQ score for the Negro samples was almost one standard deviation below the mean of the standardization sample (85 for Negro males and 87 for Negro females). In both races, girls had higher scores than boys.

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[8] For a discussion of this statistic, see Hayes (1963). In the body of the report, the omega^2 statistic is expressed as the percentage of variance among achievement groups accounted for by a particular variable. Figures in the Appendix are in terms of the proportion of variance. The magnitude of the omega^2 statistic is partly affected by the size of the sample. This effect is opposite to the relationship of significance level and sample size, i.e., it is more likely to have a larger percentage of variance accounted for across groups in small samples than in large samples. In comparing the strength of associations in different groups, it is necessary that the groups be of similar size.

Table 1

Mean Performance on the 6th Grade Standardized Tests in the Combined Samples, High and Low SES and IQ Levels and Race and Sex Samples

		6th CTMM IQ	6th CAT Reading
Combined	M	102.32	5.83
(N=3651)	SD	17.00	1.51
High SES	M	108.52	6.40
(N=1487)	SD	15.60	1.45
Low SES	M	97.92	5.41
(N=1971)	SD	16.39	1.40
High IQ	M	113.75	6.66
(N=2157)	SD	9.69	1.18
Low IQ	M	85.82	4.62
(N=1494)	SD	10.50	1.06
White Males	M	103.26	5.76
(N=1624)	SD	16.76	1.55
White Females	M	105.62	6.21
(N=1600)	SD	15.14	1.38
Negro Males	M	85.42	4.42
(N=231)	SD	15.66	1.13
Negro Females	M	87.58	4.92
(N=196)	SD	15.87	1.16

In the high and low IQ stratifications, which were formed on the basis of scores on this test, the high IQ group had a mean IQ score of 114; the low IQ group had an IQ of 86, or approximately one standard deviation above and one standard deviation below the standardization mean of 100. As would be expected in dividing the distribution in half, the variance in the two IQ levels was reduced, with the standard deviation being approximately 10 at each level. Although the majority of the Negro subjects were included in the low IQ group, the converse, which the mean IQ score of 86 in the low IQ group might suggest, was not true. Only 340, or approximately one-fifth, of the 1494 low IQ subjects were Negro.

The high SES group had a mean IQ score of 109; the low SES group had a mean IQ of 98, showing a relationship between SES level and IQ performance. The standard deviation of IQ scores in the high and low SES levels was close to the standardization S.D. of 16, indicating that IQ was distributed within the high and low SES levels approximately the same as in the standardization sample.

In 6th grade reading level, the combined samples had a mean score of 5.8, which was .3 grade equivalents below the 50th percentile for the standardization norm group (6.1). The differences between race and sex samples and high and low stratifications on the reading score followed the same pattern as the differences in IQ score. Females in both races had a higher mean reading level than males. The mean reading score in the Negro samples was more than

one grade below normative placement. As with the IQ score, the high and low IQ groups were separated more than the high and low SES groups in mean reading level. This reflects the higher correlation between IQ and reading level than between SES level and reading level.[9]

A further description of the distribution of CAT Reading scores is presented in Table 2, where the percentage of subjects in each of the standardization norm centile categories is given. In this table, underachievement or deficiency in reading in relation to grade placement can be determined for the samples of the study. With a commonly-used criterion of reading deficiency as a reading level two or more years below grade placement (which corresponds to scores in the first centile), 17.6% of the white male, 7.2% of the white female, 43.8% of the Negro male, and 26.2% of the Negro female samples would be classified as deficient in reading skills. Within both races, prevalence of reading deficiency among boys was twice as great as among girls using this criterion. The percentages of subjects reading below the 20th percentile (1.2 grades below grade placement) were 30.9% for white males, 17.3% for white females, 67.1% for Negro males, and 48.6% for Negro females.

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[9]In other analyses of these data, the correlation of SES level and 6th grade reading level in the white samples ranged from .31 to .35; the correlation of the CTMM IQ score and the CAT Reading score was approximately .80. IQ level and SES level correlations were from .31 to .33. All correlations in the Negro samples were .10 to .15 points lower than in the white samples.

Table 2

Distributions of the CAT Total Reading Score in Percentile and Grade Equivalent Categories for Race, Sex, and Combined Samples[a]

		Grade Equivalent									
		1.0-4.1	4.2-4.9	5.0-5.4	5.5-5.7	5.8-6.0	6.1-6.4	6.5-6.8	6.9-7.3	7.4-7.8	7.9-9.9
		Percentile									
		0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Combined Samples (N=3892)	N	593	508	532	301	294	343	349	362	247	363
	%	15.2	13.0	13.7	9.7	7.6	8.8	9.0	9.3	6.4	9.3
White Males (N=1742)	N	306	231	228	132	127	137	149	170	110	152
	%	17.6	13.3	13.1	7.6	7.3	7.9	8.6	9.8	6.3	8.7
White Females (N=1687)	N	122	171	218	131	146	191	183	186	133	206
	%	7.2	10.1	12.9	7.8	8.6	11.3	10.8	11.0	7.9	12.2
Negro Males (N=249)	N	109	58	45	11	9	5	6	3	1	2
	%	43.8	23.3	18.1	4.4	3.6	2.0	2.4	1.2	0.4	0.8
Negro Females (N=214)	N	56	48	41	27	12	10	11	3	3	3
	%	26.2	22.4	19.2	12.6	5.6	4.7	5.1	1.4	1.4	1.4

[a]Percentiles and grade equivalents from standardization norms. Manual, California Achievement Tests. Elementary Battery, 1950 edition. Los Angeles: California Test Bureau, 1951.

Percentage of Reading Deficiency Relative to Expected Reading Level

Underachievement in relation to expected reading level was defined as a CAT Reading score of .9 grade equivalents (2 stanines) or more below the score predicted by a subject's CTMM IQ score. The correlation between 6th CAT Reading subtest and the 6th CTMM, the regression coefficients to obtain the predicted reading score, and the standard errors of estimate in each of the samples (the standard deviation of the discrepancy between predicted and obtained reading scores) are presented in Table 3. Since the standard error of estimate in three of the four samples was between .8 and .9 grade equivalents, a single standard error of estimate (.85) was used to classify the three achievement groups.

In Table 4, the number and percentage of subjects classified as underachievers, average achievers, and overachievers in the race-by-sex samples and high and low SES and IQ groups are presented. In the white male and white female samples, the prevalence of underachievement in reading was approximately the same (15%). (This is in contrast to the much higher percentage of underachievers among males when the criterion of norm grade placement was used.) In the Negro samples, the percentage of subjects classified as underachievers was less than in the white samples, with 11.7% of the Negro males and 10.7% of the Negro females reading .9 grade units or more below their expected level (12.8% of the Negro females would be classified as underachievers if the smaller S.E.E. of that sample were used).

Table 3

Correlations Between 6th CAT Reading Subtest and 6th CTMM, Regression Coefficients for Predicted Reading Score, Standard Errors of Estimate, and Estimated Reliability of Classification

	r	a	b	S.E.E.	S.D.$_{de}$[a]	p[b]
White Males	.82	-2.303	.0779	.885	.522	.045
White Females	.78	-1.240	.0705	.865	.454	.028
Negro Males	.61	.513	.0453	.856	.338	.006
Negro Females	.74	.242	.0535	.768	.372	.020

[a]Standard deviation of differences arising from errors of measurement (Thorndike, 1963). Formula includes S.D. on 6th CAT Reading and correlation between 6th CAT Reading and 6th CTMM scores obtained in each sample and reliability coefficients for the CAT Reading test (.94) and CTMM (.92) reported by the California Test Bureau.

[b]Probability of misclassification beyond 1 S.E.E. (one tail).

Table 4

Number and Percentage of Underachievers, Average Achievers, and Overachievers in the Combined Samples, High and Low SES and IQ Levels and Race and Sex Samples

		Underachievers (Below 1 S.E.E.)	Average Achievers (-1 S.E.E. to + 1 S.E.E.)	Overachievers (Above 1 S.E.E.)
Combined Samples	N	536	2537	578
	%	14.7	69.5	15.8
High SES	N	193	1001	293
	%	13.0	67.3	19.7
Low SES	N	315	1401	255
	%	16.0	71.1	12.9
High IQ	N	319	1495	343
	%	14.8	69.3	15.9
Low IQ	N	217	1042	235
	%	14.5	69.7	15.7
White Males	N	248	1105	271
	%	15.3	68.0	16.7
White Females	N	240	1116	244
	%	15.0	69.7	15.3
Negro Males	N	27	168	36
	%	11.7	72.7	15.6
Negro Females[a]	N	21	148	27
	%	10.7	75.5	13.8

[a]Classification in each sample was based on a standard error of .85. With the S.E.E. obtained in the Negro female sample (.77), 24 Negro females were classified as underachievers (12.8%), 143 as average achievers (72.9%), and 28 as overachievers (14.3%).

The similar percentage of Negro male and female underachievers also differed considerably from percentages obtained when the criterion of grade placement was used to define underachievement.

The probability of subjects being misclassified as underachievers solely because of errors of measurement (i.e., in the CAT Reading and CTMM scores) was estimated to be 4.5% in the white male sample, 2.8% in the white female sample, 0.6% in the Negro male sample, and 2.0% in the Negro female sample (Table 3). The higher reliability of the classification in the Negro samples resulted from the lower correlation between the reading score and IQ score in these samples. In the calculation of the standard deviation of differences arising from errors of measurement, the reliability coefficients for the CAT Reading test and the CTMM were assumed to be the same in the Negro samples as in normative samples for these tests, an assumption that may not be warranted. It is interesting, however, that when the estimated percentage of subjects misclassified as underachievers in each sample is subtracted from the percentage of underachievers reported in Table 4, the estimates of underachievement in all four samples are very similar (between 11% and 12%).[10] It can also be seen in Table 4 that as many or slightly

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[10] Subtraction of the percentage of the subjects that were possibly misclassified as underachievers provides the most conservative estimate of underachievement: 10.8% for white males, 12.2% for white females, 11.1% for Negro males, and 10.8% for Negro females.

more subjects were classified as overachievers than underachievers in the race-by-sex samples.

When students with an IQ score above 100 were compared to those with an IQ below 100 it was found that the high and low IQ groups did not differ in the percentage of underachievers, average achievers, and overachievers. The high SES and low SES groups, however, did differ. Sixteen percent of subjects in the low SES level, or 3% more than in the high SES level, were classified as underachievers, and 19.7% of the high SES group, or 8% more than the low SES group, were classified as overachievers. Since the prevalence of underachievement was not different in the IQ groups, the higher prevalence of underachievement in low SES level could not be attributed to the association of SES and IQ. This would support the conclusion that socio-economic background is related to reading achievement independent of general mental ability inferred from the IQ score.

Differences Between Achievement Groups in IQ Score and SES Level

In the comparisons of the achievement groups that follow, it would be desirable that achievement groups stratified on SES level did not differ significantly in IQ score and that achievement groups in high and low IQ levels did not differ in SES level, so that differences among the achievement groups could be attributed to independent effects of the achievement classification. In the combined samples the achievement groups did not differ in 6th CTMM IQ score. It was also necessary, however, to determine whether

the race and sex samples that made up the total population differed in IQ scores.

The mean IQ scores in the high and low stratifications and race-by-sex samples are presented in Table 5. There were no significant differences in IQ among the achievement groups in any of the four race-by-sex samples nor in the high SES and high IQ levels. In the low SES and low IQ levels, achievement groups did differ significantly in mean IQ score; however, in both cases underachievers had a higher mean than average achievers and overachievers. Because of the relationship of IQ level to achievement, differences in this direction would work against finding a significant relationship between underachievement in reading and lower performance on later achievement measures.

The mean SES levels in the high and low stratifications and race-by-sex samples are presented in Table 6. Significant differences across achievement groups in the high SES and high IQ levels were found, with overachievers having the highest mean SES. In both of these stratifications, significant differences resulted primarily from the higher SES level of white female overachievers and, secondarily, from higher levels of Negro female overachievers. Differences were not significant among males in the high levels of SES and IQ. In the low IQ level, there were not significant differences across achievement groups in any of the four race-by-sex samples; however, achievement groups did differ significantly in the combined low IQ group as a result of a summation of low level

Table 5

Mean Performance on the 6th Grade CTMM IQ Score of Under-, Average, and Overachievers in the Combined Samples, High and Low SES and IQ Levels and Race and Sex Samples

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined samples	N	536	2537	578		
	M	103.10	102.25	101.92	.75	0.00
	SD	15.51	16.85	18.88		
High SES	N	193	1001	293		
	M	107.77	109.12	106.94	2.46	0.20
	SD	14.04	15.44	16.99		
Low SES	N	315	1401	255		
	M	100.52	97.77	95.53	6.76[a]	0.58
	SD	15.68	16.01	18.75		
High IQ	N	319	1495	343		
	M	113.61	113.53	114.82	2.50	0.14
	SD	9.11	9.76	9.85		
Low IQ	N	217	1042	235		
	M	87.66	86.06	83.10	11.65[b]	1.41
	SD	8.42	10.49	11.73		
White males	N	248	1105	271		
	M	103.43	103.48	102.22	.63	0.00
	SD	14.91	16.72	18.46		
White females	N	240	1116	244		
	M	106.08	105.55	105.47	.13	0.00
	SD	14.20	14.78	17.54		
Negro males	N	27	168	36		
	M	87.04	85.08	85.83	.19	0.00
	SD	12.74	15.57	18.23		
Negro females	N	21	148	27		
	M	86.00	87.66	88.37	.14	0.00
	SD	17.42	14.98	19.61		

[a] $p < .01$

[b] $p < .001$

Table 6

Mean SES Level of Under-, Average, and Overachievers in the Combined Samples, High and Low SES and IQ Ranges, and Separate Race and Sex Samples

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined samples	N	508	2402	548		
	M	3.54	3.40	3.13	17.55[c]	0.95
	SD	1.08	1.17	1.25		
High SES	N	193	1001	293		
	M	2.39	2.24	2.17	3.96[a]	0.40
	SD	0.80	0.86	0.88		
Low SES	N	315	1401	255		
	M	4.24	4.23	4.23	0.08	0.00
	SD	0.43	0.42	0.42		
High IQ	N	305	1428	324		
	M	3.33	3.10	2.80	15.47[c]	1.39
	SD	1.13	1.21	1.26		
Low IQ	N	203	974	224		
	M	3.85	3.85	3.61	5.74[b]	0.67
	SD	0.90	0.95	1.05		
White males	N	235	1046	252		
	M	3.39	3.23	3.08	4.36[a]	0.44
	SD	1.10	1.15	1.21		
White females	N	228	1061	235		
	M	3.48	3.26	2.88	17.88[c]	2.17
	SD	1.02	1.12	1.20		
Negro males	N	25	159	35	0.45	0.00
	M	4.48	4.50	4.37		
	SD	0.59	0.76	0.73		
Negro females	N	20	136	26		
	M	4.70	4.55	4.19	3.33[a]	2.50
	SD	0.57	0.69	1.02		

Note.--Lower means indicate higher SES level.

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

relationships in the smaller samples. The major difference in SES in the low IQ level occurred between average achievers and overachievers; the mean SES level of underachievers and average achievers was the same. Significant differences in SES level in the race-by-sex samples showed the greatest difference to be in the white female sample, and as pointed out, primarily among high IQ and high SES white females.

In comparisons of achievement groups on later measures of achievement and behavior, it was considered that mental ability level was controlled. However, in some comparisons, particularly among achievement groups in the high SES and high IQ levels, differing SES background of the groups must be considered as potentially contributing to differences.[11]

Reading Level of Achievement Groups in Grades 6, 7, and 9

Comparison of the three achievement groups in the combined samples in reading level in grades 6, 7, and 9 showed that underachievers, as a group, performed significantly lower than average and overachievers in all three grades and remained below grade placement in all grades measured (Part I). There was also attrition in the number of subjects over grades 7 and 9 from missing data or school dropout. Attrition

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[11]The relationship of reading achievement to socio-economic background measures and family characteristics is treated in more detail in Part III of this report.

was greater in the lower levels of the performance distribution, which would lead to the expectation that the mean performance of the underachievers would improve from grade 7 to 9. This was not the case, however. The mean reading level relative to grade placement remained the same from grade 7 to 9, indicating that many underachievers fell farther behind in reading level over subsequent grades. Projection of the expected reading level in the 6th grade to the 7th and 9th grades also supported that only in a few cases did true underachievers raise their level of performance relative to grade placement over secondary school grades.

Extension of these analyses was done in order to determine whether the same evidence for the enduring status of underachievement occurred in the different SES, IQ, race, and sex groupings.

It is necessary to consider two factors in interpreting the results of these comparisons. First, the tests administered in the 6th and 7th grades were from different publishers and, hence, were based on different normative samples. In the analysis of the combined samples (Part I), it appeared that neither of the two SAT norms (modal-age and total-grade norms) were directly related to the CAT norms.[12] Second, there was an attrition of subjects through

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[12]In the following comparison, the modal-age norms of the SAT were used for comparison of performance across grades 6 to 9 because they showed the least deviation from the performance of groups on the CAT norms. Differences in the two tests would not affect comparison of the relative performance of the achievement groups because differences were the same for all groups. Differences between SAT total-group and modal-age norms are fairly constant

transfer and dropout between grades 6 and 9 resulting in a smaller number of subjects in the groups in successive years. Since there was evidence that attrition was greatest in the lower levels of performance, it was expected that mean scores of groups would rise over successive grades.[13]

The mean reading level in grades 6, 7, and 9 of the achievement groups in the race-by-sex samples is presented in Table 7. In both the white male and white female samples, mean differences across achievement groups were significant at all three testings ($p < .001$), with underachievers reading below grade placement and below average achievers in each grade. There was some decrease over grades in the advantage held by overachievers and a slight increase in performance of underachievers, which could result from regression of scores and attrition of subjects. The omega^2 statistic reflects this increased similarity in the groups over grades, showing a decrease in the percentage of variance across groups accounted for from over 20% in the 6th grade to 5% in the 9th grade. The significance levels and percentage of variance accounted for by these

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over the percentile distribution, with total-group grade equivalents being .5 and .3 lower than modal-age (grades 7 and 9, respectively). An approximate conversion to total-grade norm placement would therefore place the mean performance of underachievers approximately .5 and .3 grade equivalents closer to grade-level and overachievers approximately .5 and .3 grade equivalents higher than grade-level.

[13]Some regression toward the mean of the extreme groups (underachievers and overachievers) would also be expected on retest.

Table 7

Mean Reading Level of Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega^2
			WHITE MALE SAMPLE			
6th CAT Reading Total	N	248	1105	271		
	M	4.43	5.75	7.02	230.63[a]	22.05
	SD	1.15	1.38	1.53		
7th SAT Reading Average	N	210	956	231		
	M	5.81	6.84	7.88	54.77[a]	7.15
	SD	1.81	2.09	2.25		
9th SAT Reading Average	N	138	652	154		
	M	8.56	9.62	10.24	25.32[a]	4.90
	SD	2.23	2.03	1.93		
			WHITE FEMALE SAMPLE			
6th CAT Reading Total	N	240	1116	244		
	M	4.92	6.19	7.54	302.02[a]	27.34
	SD	1.07	1.15	1.36		
7th SAT Reading Average	N	212	989	209		
	M	6.28	7.26	8.46	72.62[a]	9.22
	SD	1.64	1.88	2.02		
9th SAT Reading Average	N	161	740	151		
	M	9.00	9.73	10.61	28.66[a]	5.00
	SD	1.90	1.89	1.78		

[a] $p < .001$

Table 7 (continued)

Mean Reading Level of Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega²
			NEGRO MALE SAMPLE			
6th CAT Reading Total	N	27	168	36		
	M	3.17	4.32	5.81	72.81[a]	38.34
	SD	.69	.88	1.04		
7th SAT Reading Average	N	18	129	24		
	M	4.15	4.43	5.21	6.17[a]	5.71
	SD	.87	1.11	1.22		
9th SAT Reading Average	N	4	24	9		
	M	5.70	5.69	7.08	2.91	9.37
	SD	.97	1.45	1.78		
			NEGRO FEMALE SAMPLE			
6th CAT Reading Total	N	21	148	27		
	M	3.50	4.88	6.26	51.93[a]	34.20
	SD	.88	.91	1.12		
7th SAT Reading Average	N	13	106	19		
	M	4.44	4.90	5.68	6.23[a]	7.04
	SD	.75	1.04	1.25		
9th SAT Reading Average	N	3	33	6		
	M	5.67	6.94	7.38	.92	.00
	SD	2.10	1.66	2.44		

[a] $p < .001$

measures in the white male and white female samples were very similar to the results with the combined sample, and, except for the consistently higher performance of white females in corresponding achievement groups, there was no significant difference in performance of achievement groups related to sex.

In both of the Negro samples, achievement groups were significantly different in mean reading level in the 6th and 7th grades, with underachievers reading below average achievers in both grades. In both Negro male and Negro female samples, there was a marked regression of mean scores in the 7th grade testing. Underachievers showed an advance of one grade level. Average achievers showed very little change in grade placement, and overachievers had a mean grade placement that was actually lower than that obtained in the 6th grade. Possible effects of the different tests in these two grades make it difficult to assess the actual progress of the three groups. The overachievers, however, remained significantly higher in mean reading level than average achievers in the 7th grade. Because of the large number of missing scores, performance on the 9th SAT may not be a reliable indication of reading achievement in the Negro samples.[14] Although achievement groups were not significantly different on this test, the trend

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[14]Missing data on the 9th SAT Reading test did not result primarily from attrition through dropout or transfer. With contemplated changes in the county testing program that year, both the SAT and ITED batteries were given. It is possible that the SAT was not given in all schools or the records were not kept.

of means was the same as in the 7th grade, with overachievers reading at a higher level and underachievers reading at the same level (Negro male sample) or a lower level (Negro female sample) than average achievers. All achievement groups showed an advance in mean performance in the 9th grade; however, no group had an increase equal to the two grades between testings. This resulted in a drop in mean performance relative to grade placement from grades 6 to 9 for all achievement groups.

A further comparison of achievement groups in 9th grade reading level could be made from results on the two reading tests from the ITED (Test 5: Ability to Interpret Reading Materials in the Social Studies, and Test 6: Ability to Interpret Reading Materials in the Natural Sciences). Since the ITED performance was expressed in terms of standard scores, the only comparable unit available to compare reading level across the CAT, SAT, and ITED was the percentile equivalent of the mean scores for the achievement groups. These percentiles are presented in Table 8.

The percentile equivalent of the means on the ITED was higher than on the SAT in all achievement groups and samples.[15] In the white samples, underachievers performed at about the 50th percentile

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[15] Difference in content of these tests could be a factor contributing to different performance levels. Scores from ITED tests primarily reflected reading comprehension, whereas the CAT and SAT scores were combinations of comprehension and vocabulary or word meaning subtests. Performance of achievement groups on these subtests was not compared. Data for the 6th CAT comprehension and vocabulary and the 7th SAT paragraph meaning and word meaning subtests are included in the Appendix.

Table 8

Norm Percentile Rank of Mean Reading Test Scores of Under-, Average, and Overachievers

	Under-achievers	Average achievers	Over-achievers
		WHITE MALE SAMPLE	
6th CAT Reading Total	13	37	73
7th SAT Reading Average	34	50	71
9th SAT Reading Average	37	52	60
9th ITED Social Studies Reading	49	66	75
9th ITED Natural Science Reading	47	64	71
		WHITE FEMALE SAMPLE	
6th CAT Reading Total	19	53	83
7th SAT Reading Average	42	62	79
9th SAT Reading Average	42	54	68
9th ITED Social Studies Reading	53	66	77
9th ITED Natural Science Reading	48	59	76
		NEGRO MALE SAMPLE	
6th CAT Reading Total	2	11	40
7th SAT Reading Average	9	10	21
9th SAT Reading Average	5	5	18[a]
9th ITED Social Studies Reading	5	20	32
9th ITED Natural Science Reading	14	22	29[a]
		NEGRO FEMALE SAMPLE	
6th CAT Reading Total	5	19	55
7th SAT Reading Average	10	16	31
9th SAT Reading Average	5	16	21[a]
9th ITED Social Studies Reading	22	28	51
9th ITED Natural Science Reading	14	20	28[a]

[a]Mean difference across groups not significant.

on the ITED reading test. Their performance, however, was significantly below that of average and overachievers (means and significance tests are presented in Table 16, page 65). In the Negro samples, the percentile figures indicated that the lack of significant difference on the 9th SAT reading average resulted more from a drop in the performance of average and overachievers rather than an increase in the performance of underachievers. On both ITED reading tests, the groups were more widely separated. Differences between achievement groups in social studies reading was significant in both the Negro male and Negro female samples. Underachievers also had a mean performance below average and overachievers on the ITED natural science reading; however, differences were not statistically significant in either sample.

The mean reading scores in the 6th, 7th, and 9th grades of the high IQ and low IQ achievement groups are presented in Table 9. Mean differences across the achievement groups were significant at all three testings ($p < .001$), with underachievers reading at a level below average achievers of similar IQ. In both the high and low IQ levels, percentage of variance accounted for across the achievement groups decreased over successive grades. The percentage figures also indicated that the achievement groups in the high IQ range were more widely separated than those in the low IQ range. In Figure 1, the mean scores for the high and low IQ achievement groups are shown in relation to the normative grade level for the

Table 9

Mean Reading Level of High and Low IQ Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega^2
			HIGH IQ			
6th CAT Reading Total	N	319	1495	343		
	M	5.28	6.63	8.09	839.49[a]	43.74
	SD	.85	.88	.91		
7th SAT Reading Average	N	282	1306	289		
	M	6.66	7.86	9.16	149.27[a]	13.64
	SD	1.62	1.76	1.69		
9th SAT Reading Average	N	211	966	201		
	M	9.47	10.47	11.32	86.41[a]	11.03
	SD	1.73	1.45	.94		
			LOW IQ			
6th CAT Reading Total	N	217	1042	235		
	M	3.48	4.60	5.73	386.21[a]	34.02
	SD	.66	.87	.97		
7th SAT Reading Average	N	171	874	194		
	M	4.70	5.20	6.04	50.12[a]	7.35
	SD	1.17	1.31	1.52		
9th SAT Reading Average	N	95	483	119		
	M	7.08	7.70	8.50	15.92[a]	4.11
	SD	1.93	1.81	2.03		

[a] $p < .001$

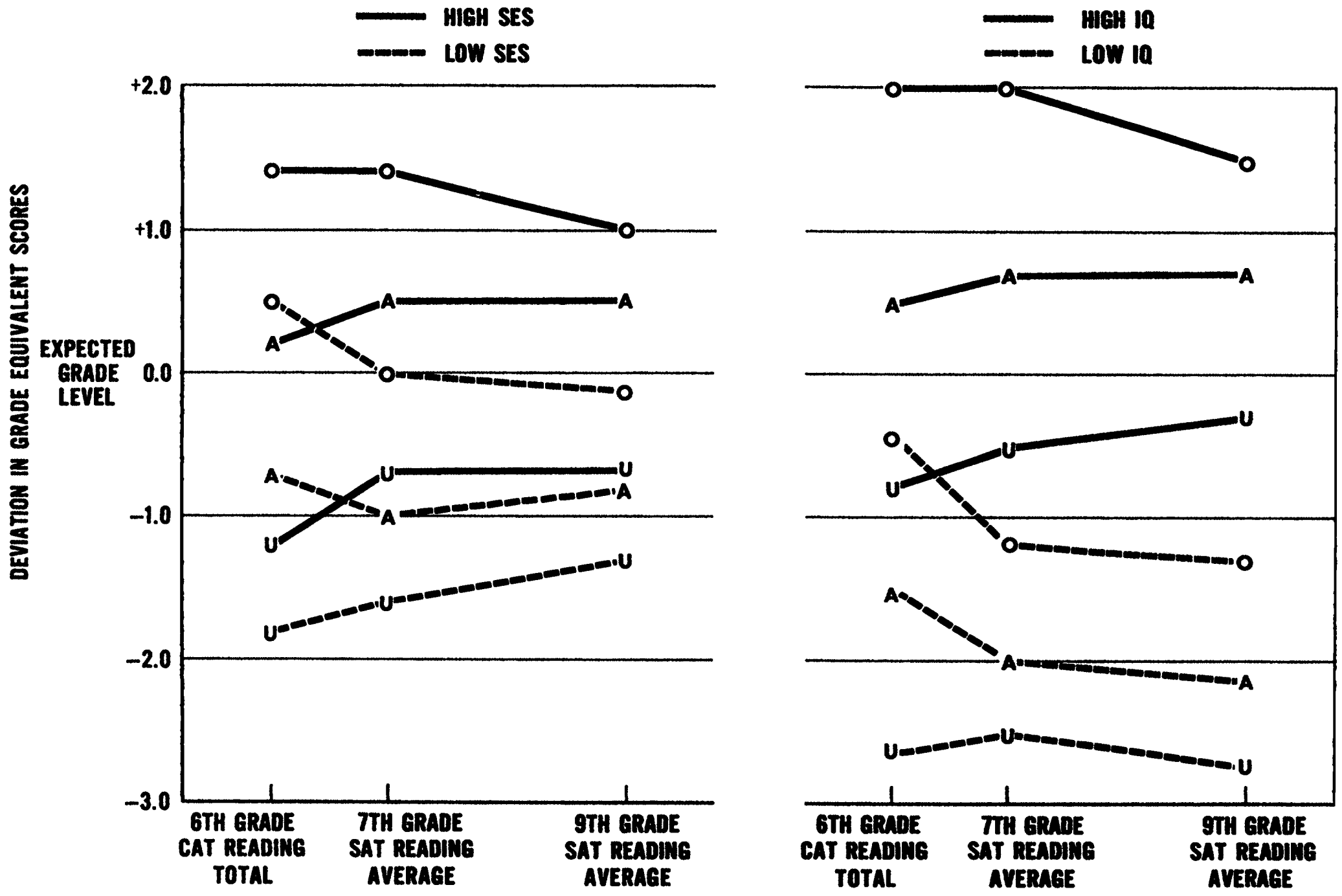
time of testing. Although there was a decrease in the percentage of variance across groups in the 7th and 9th grades (i.e., an increase in the variability of scores within each group in later grades), the plots in Figure 1 show that with the exception of a slight gain relative to grade placement of the high IQ underachievers and the slight loss relative to grade placement of all three low IQ achievement groups, the mean performance of all groups changed very little.

The results showed a strong relationship of IQ test performance to reading achievement in later grades. Average achievers in the high IQ level were reading .5 grade units above grade placement; whereas, average achievers in the low IQ level were reading 1.5 to 2.0 grade units below grade placement. High IQ underachievers were reading at a higher level than low IQ overachievers in the 7th and 9th grades. High IQ underachievers had a reading level that was below grade placement, however, and much lower than high IQ average achievers. The relationship of 6th grade IQ level to reading performance was also independent of the relationship of the reading achievement classification in the 6th grade. Within both IQ levels, later reading performance was significantly different for under-, average, and overachievers.

The slight loss relative to grade placement from grades 7 to 9 in the low IQ groups did not appear on inspection to be statistically significant, since the mean loss was not greater

FIGURE 1

MEAN READING LEVEL OF UNDERACHIEVERS (U), AVERAGE ACHIEVERS (A), AND OVERACHIEVERS (O) CORRECTED FOR GRADE LEVEL



than .5 grade units in any group and the standard deviation of scores on these testings was 1.0 to 2.0 grade units. This was not the pattern, however, that would be expected from the regression of scores and attrition of subjects between these grades. (The expected pattern was that reflected in the performance of high and low SES groups shown in the lefthand portion of Figure 1.) Since all low IQ achievement groups showed a decrease relative to grade placement, the effect was not related to the under-, average, and overachievement phenomena, but rather reflected an interaction between IQ level and reading achievement. Although all groups gained in reading skills from grades 6 to 9, the gain of the low IQ groups was less than the approximately 3.5 grade-years between tests; hence, there was decrease relative to grade placement. On the other hand, high IQ average and underachievers maintained a gain equal to or slightly greater than normative expectation over these grades. Although somewhat aside from the question of the effects of underachievement in reading, the difference in achievement gain as a function of level of general ability and level of reading has implications for expectation of pupil performance. Students whose IQ and reading scores are low in the 6th grade, other factors equal, should be expected to show a slow acquisition and development of skills in later grades, resulting in a performance below the norm through successive

grades (Tilden, 1953).[16]

Comparisons of the high and low SES achievement groups on the 6th, 7th, and 9th grade reading tests are presented in Table 10 and Figure 1. As in the IQ stratification, differences among achievement groups were significant in both high and low SES levels on all tests. Within both high and low levels, underachievers remained below average achievers in all grades. The percentage of variance accounted for across achievement groups was less than that accounted for in the IQ stratifications, and the over-all relationship of SES to reading achievement was less than that of the IQ score, as reflected in the smaller range of mean scores across the six groups (see Figure 1).[17]

Although there was some reversal in the performance of groups from grades 6 to 7 (e.g., low SES overachievers had a higher mean score than high SES average achievers in the 6th grade, but a lower mean score in the 7th grade), comparisons were across different tests and standardization norms. From grades 7 to 9 the mean performance of all achievement groups changed very little, indicating stability in the status of under-, average, or

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[16]Slow gain resulting in loss relative to grade placement in the Negro male and Negro female samples may also be associated with low IQ and reading test performance levels of these samples in the 6th grade.

[17]Some of the differences between the high and low SES groups reflect the differences between high and low IQ groups since these measures are correlated, i.e., high SES groups had significantly higher IQ scores than low SES groups.

Table 10

Mean Reading Level of High and Low SES Under-, Average, and Overachievers in the 6th, 7th, and 9th Grades

		Under-achievers	Average achievers	Over-achievers	F	omega^2
			HIGH SES			
6th CAT Reading Total	N	193	1001	293		
	M	4.93	6.35	7.53	252.15[a]	25.25
	SD	1.10	1.25	1.36		
7th SAT Reading Average	N	170	893	247		
	M	6.46	7.68	8.56	54.76[a]	7.58
	SD	1.79	2.03	2.08		
9th SAT Reading Average	N	124	644	173		
	M	9.15	10.32	10.75	32.55[a]	6.28
	SD	2.03	1.69	1.68		
			LOW SES			
6th CAT Reading Total	N	315	1401	255		
	M	4.34	5.43	6.63	234.54[a]	19.16
	SD	1.16	1.24	1.44		
7th SAT Reading Average	N	272	1237	225		
	M	5.62	6.20	7.25	47.96[a]	5.14
	SD	1.66	1.85	2.17		
9th SAT Reading Average	N	178	777	142		
	M	8.49	8.95	9.72	13.68[a]	2.26
	SD	2.09	2.09	2.12		

[a] $p < .001$

overachievement seen in the other comparisons. Although SES level was related to achievement in reading over and above IQ level, in that a higher percentage in the low SES group were underachievers than in the high SES group, the pattern of underachievement was similar. Both high and low SES underachievers were reading below grade level and below average achievers of comparable SES level, and, as a group, remained underachievers to at least the time of the 9th grade testing.

Relationship of Reading Achievement to Other Academic Performance Measures

In the comparisons of the performance of underachievers, average achievers and overachievers in the combined samples (Part I), it was found that underachievers in reading, as a group, performed significantly lower than average or overachievers in other scholastic areas in the 6th grade and in grade point average and test score performance throughout secondary school. Achievement measures used to compare groups were grade point averages for full unit courses in grades 7 through 12, grade point averages in subject matter areas that were averaged over the years that a student was in school, the 6th grade CAT Arithmetic and Language scores, the 7th grade SAT Arithmetic and Language scores, and the scores on the nine subtests of the ITED given in the second semester of the 9th grade.

When the same measures were used to compare the performance of under-, average, and overachievers within high and low IQ and SES levels and in the four race-by-sex samples, the pattern of performance was generally the same as found in the combined samples, namely, within each of these subgroups underachievers consistently performed at a lower level than average and overachievers of the same group. With the general conclusion that the relationships of underachievement in reading to other academic measures is essentially the same within, and therefore largely independent of, race, sex, high or low SES background, and high or low mental ability, the presentation of the results will focus on examples of this pattern and data indicating where exceptions to the pattern may exist. Complete statistical data for measures only partially described or tabled in the text can be found in the Appendix.

Yearly Grade Point Averages. The mean grade point average in the 6th grade and the mean full-unit-course grade point averages in grades 7 to 12 are presented for the achievement groups in the race and sex samples in Table 11. In the two white samples, differences across achievement groups were significant in each grade ($p < .001$), with underachievers receiving lower marks than average achievers in all grades. The percentage of variance accounted for across groups decreased over successive grades. There was no difference between the pattern of performance found in the white male and white female samples, or from that found in the combined sample,

Table 11

Mean Grade Point Average of Under-, Average, and Overachievers in Grades 6 Through 12

Grade	N of Sample	Under-achievers	Average achievers	Over achievers	F	omega^2
			WHITE MALE SAMPLE			
6	1498	1.67	1.91	2.09	44.37[c]	5.47
7	1471	2.57	3.04	3.38	40.71[c]	5.12
8	1594	2.59	2.98	3.34	29.72[c]	4.01
9	1296	2.64	2.94	3.15	14.98[c]	2.11
10	1193	2.42	2.66	2.90	11.68[c]	1.76
11	975	2.52	2.76	2.90	7.89[c]	1.39
12	878	2.70	2.97	3.14	10.99[c]	2.22
			WHITE FEMALE SAMPLE			
6	1505	1.84	2.08	2.31	55.74[c]	6.78
7	1450	3.15	3.54	3.98	40.49[c]	5.16
8	1372	3.08	3.42	3.82	28.78[c]	3.89
9	1310	3.05	3.32	3.65	21.29[c]	3.00
10	1235	2.82	3.03	3.39	18.18[c]	2.71
11	1089	2.92	3.11	3.43	13.91[c]	2.32
12	987	3.23	3.44	3.67	11.83[c]	2.15
			NEGRO MALE SAMPLE			
6	222	1.50	1.71	2.09	12.73[c]	9.56
7	214	2.42	2.69	3.08	4.97[a]	3.58
8	201	2.12	2.52	2.99	7.89[c]	6.41
9	184	2.29	2.48	2.75	2.09	1.26
10	148	2.26	2.51	2.76	2.37	1.82
11	128	2.69	2.65	2.84	.61	0.00
12	109	2.54	2.68	2.94	1.72	1.31

(continued)

Table 11 (continued)

Grade	N of Sample	Under-achievers	Average achievers	Over achievers	F	omega^2
			NEGRO FEMALE SAMPLE			
6	187	1.72	1.92	2.27	5.80[b]	4.88
7	175	2.81	3.22	3.56	3.07[a]	2.31
8	167	2.54	3.13	3.42	4.05[c]	3.52
9	153	2.61	2.99	3.44	2.78	2.28
10	129	2.76	2.92	3.41	2.70	2.57
11	101	3.25	2.97	3.11	.60	0.00
12	88	2.98	2.90	3.16	.83	0.00

Note.--6th grade average based on three possible marks: unsatisfactory, satisfactory, and outstanding, coded 1, 2, and 3, respectively. Averages in grades 7 to 12 based on five letter grades E to A, coded 1 to 5, respectively.

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

except for the higher mean grade point averages in the female sample.

In the Negro male and Negro female samples, underachievers had significantly lower grade point averages than average or overachievers in grades 6, 7, and 8. In grades 9 and 10, the trend of means across groups was the same; however, differences were not statistically significant. In grades 11 and 12, the grade point averages of the overachievement groups were higher than those of average achievers; however, average and underachievers did not differ in their course performance. As in the white samples, females consistently had higher mean grade point averages than males. In fact, in the Negro male sample, only overachievers maintained an average of "C" in the more academic subjects from grades 7 through 12.[18]

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[18]The finding that girls received higher marks than boys is consistent with findings in other studies (Anastasi, 1958). Girls' higher evaluation in coursework was found in both the white and Negro samples over all secondary school grades. Girls had higher grade point averages in all subject areas (with the exception of physical education), including the areas of science and mathematics, where the mean achievement test performance (9th grade ITED) of boys was higher than that of girls. The extent of these differences in relation to reading achievement status also showed that the class performance of girls was evaluated more highly than that of boys. In all secondary school grades, white female underachievers had higher grade point averages than white male average achievers. With the exception of the 8th grade, where Negro female underachievers and Negro male average achievers had the same grade point average, Negro female underachievers had higher GPA's than Negro male average achievers. Further, in both races, male overachievers had lower grade point averages in the 11th and 12th grades than female underachievers. Female underachievers had higher grade point averages than male average achievers in all course areas with the

Except for the indication that Negro underachievers performed as well as Negro average achievers in grades 11 and 12, the findings in the Negro samples paralleled those in the white samples.[19]

The mean yearly grade point averages for the high IQ and low IQ achievement groups are shown in Figure 2. The pattern of course-work performance of achievement groups in high and low IQ levels was the same as that found for reading achievement test performance. Mean differences across achievement groups were significant in all secondary school grades, with underachievers having a mean grade point average below average achievers of similar IQ.[20] In both high and low IQ levels, the percentage of variance accounted for across achievement groups decreased over successive grades.

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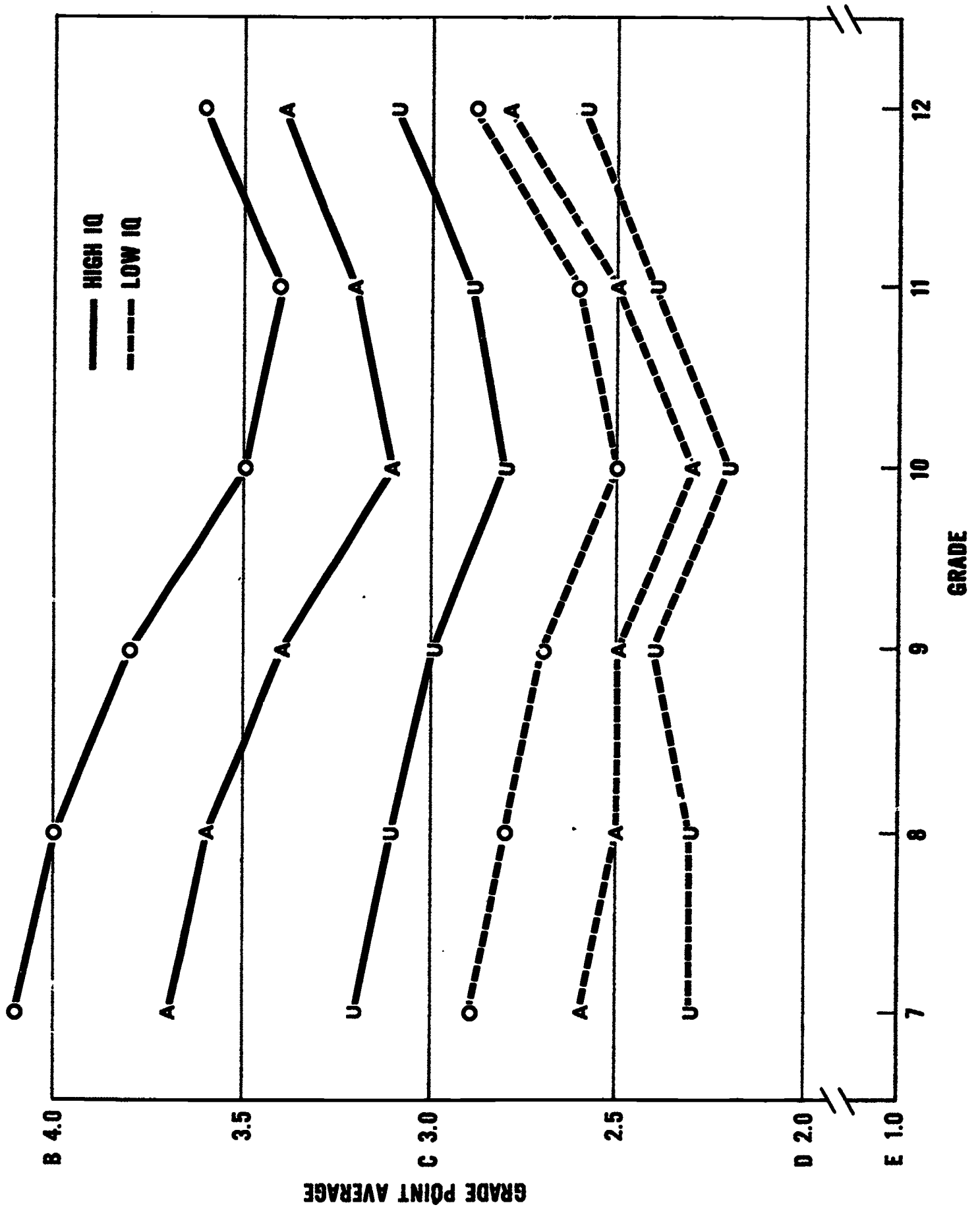
exception of science (white samples) and mathematics (Negro samples). White female underachievers even had higher grade point averages than white male overachievers in business, foreign languages, music, and art. In the Negro samples, these same differences existed in foreign languages and art.

[19]In interpreting this difference between the race groups, it is necessary to consider the greater attrition of subjects in the Negro samples, largely through dropout from high school. Although the dropout rate was high in all achievement groups in the Negro samples, it was highest among underachievers, so that by the 11th grade, grade point averages were only available for 11 of the original 27 Negro male underachievers (42%) and 6 of the original 21 Negro female underachievers (29%). Considering the selection that occurred, the finding that the 11 Negro male and 6 Negro female underachievers who graduated were receiving course marks comparable to those of average achievers does not contrast that greatly from the general findings.

[20]Differences in the high IQ group were significant at $p < .001$ in all grades. In the low IQ group, differences were significant at $p < .001$ in grades 7 to 9, and at $p < .01$ in grades 10 to 12.

FIGURE 2
MEAN GRADE POINT AVERAGES FOR HIGH AND LOW IQ UNDERACHIEVERS (U), AVERAGE ACHIEVERS (A), AND OVERACHIEVERS (O)

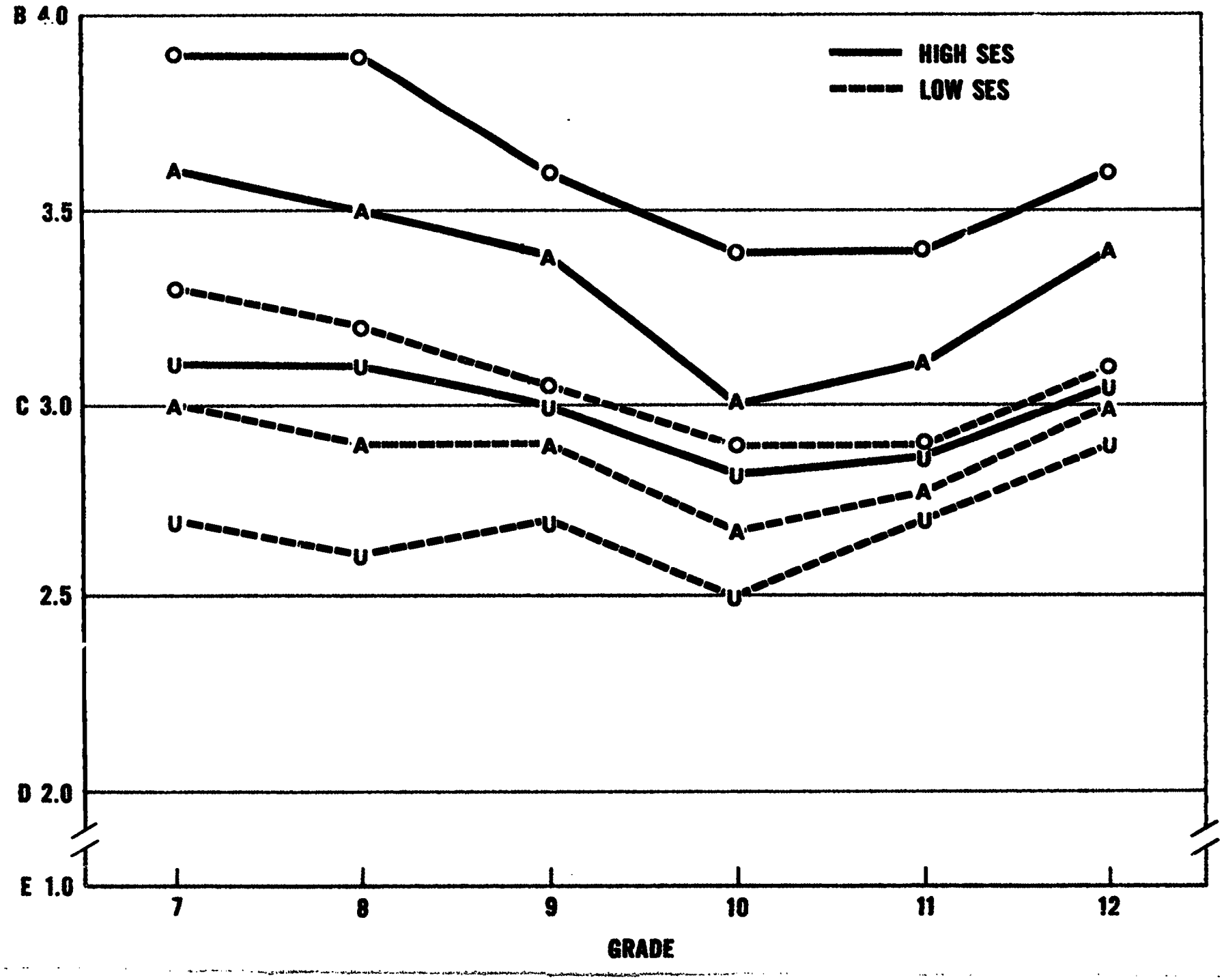


In the high IQ group, the percentage of variance accounted for across achievement groups was greater than in the low IQ range, 7.1% in the 7th grade, decreasing to 2.5% in the 11th and 12th grades. The percentage of variance accounted for across groups in the low IQ range was 4.7% in the 7th grade, decreasing to 1% in the 10th, 11th, and 12th grades.

The strong relationship of IQ scores to course performance can be seen in the wide separation of the high and low average achievement groups. High IQ average achievers had a grade point average approximately 1.0 (one letter grade) higher than low IQ average achievers. There was also no overlap in mean performance of achievement groups; high IQ underachievers maintained a higher grade point average than low IQ overachievers. Further, all low IQ achievement groups had mean grade point averages below the letter grade of C, whereas high IQ level achievement groups, with the exception of the underachievers, maintained a grade point average above C.

Mean yearly grade point averages for high and low SES achievement groups are presented in Figure 3. The relationships of achievement in reading to course performance in these groups were the same as those given for high and low IQ groups. That is, (1) mean differences across achievement groups in both high and low SES levels were significant in all grades, with underachievers having grade point averages below average achievers of similar SES background; (2) in both high and low SES levels, the percentage

FIGURE 3
MEAN GRADE POINT AVERAGES FOR HIGH AND LOW SES UNDERACHIEVERS (U), AVERAGE ACHIEVERS (A), AND OVERACHIEVERS (O)



of variance accounted for across the achievement groups decreased over successive grades; and (3) the separation of achievement groups was greater in the high SES level than in the low SES level.[21] The over-all relationship of SES to coursework performance was not as great as that of IQ level. The mean grade point average of high SES average achievers was approximately .5 units above that of low SES average achievers. Low SES overachievers maintained a grade point average that was slightly higher than that of high SES underachievers.

Course-Area Grade Point Averages. Achievement groups in the combined samples were found to differ significantly on mean grade point averages in all secondary school course areas, with underachievers having the lowest performance of the three groups (Part I). In courses required of all students, the performance of underachievers was closer to that of average achievers in science and mathematics than in English and social studies, and, with the exception of foreign language courses, underachievers were not as far below average achievers in elective course areas (foreign languages, music, and art) and in curriculum course areas (business and vocational).[22] The mean course-area grade

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[21] Levels of significance of the differences between achievement groups were the same as found in the high and low IQ groups, $p < .001$ in all grades for the high SES group. $p < .001$ in grades 7 to 9 and $p < .01$ in grades 10 to 12 in the low SES group.

[22] The business and vocational course areas correspond to two of the four curricula in grades 9 through 12, the other two being academic and general.

point averages of underachievers in the SES and IQ groups and race and sex samples are presented in Table 12.

In the required course areas of English, social studies, science, and mathematics, achievement groups in high and low SES and IQ stratifications and in the race and sex samples showed the same differences in coursework performance found in the combined samples. Differences among achievement groups were highly significant in both levels of IQ and SES and in the white male and white female samples ($p < .001$). With two exceptions, underachievers in the Negro male and Negro female samples also performed significantly lower than average or overachievers in required courses ($p < .05$). Although Negro male underachievers were not significantly lower in science GPA, and Negro female underachievers were not significantly lower in English GPA, the trend of means across groups in these course areas was the same, and differences approached significance.

In business, vocational, foreign language, music, and art grade point averages, there was a greater separation in the mean performance of achievement groups in the high SES and high IQ levels than in the corresponding low levels. In the high IQ and SES levels, differences among achievement groups were significant ($p < .001$) in all course areas. In the low SES and IQ levels, significant differences were not found in all areas. Where differences were not significant, however,

Table 12

Mean Course Area Grade Point Averages of Underachievers, Grade Units Below Mean of Average Achievers, and Percentage of Variance Accounted for Across Three Achievement Groups

Group	English	Social Studies	Science	Mathematics	Business	Vocational	Foreign Language	Music	Art
Combined Samples									
Mean	2.7	2.7	2.6	2.6	2.7	3.2	2.4	3.4	3.2
Difference	.3	.3	.3	.3	.1	.2	.4	.3	.2
% Variance	3.8[c]	3.9[c]	2.3[c]	2.5[c]	.8[c]	1.8[c]	2.6[c]	1.7[c]	.8[c]
High SES									
Mean	3.0	3.0	2.8	2.9	2.8	3.4	2.4	3.6	3.5
Difference	.3	.4	.3	.3	.2	.3	.6	.4	.2
% Variance	4.3[c]	4.7[c]	3.4[c]	2.2[c]	1.9[c]	2.5[c]	3.8[c]	2.1[c]	1.0[c]
Low SES									
Mean	2.5	2.6	2.5	2.5	2.6	3.1	2.3	3.3	3.1
Difference	.3	.2	.2	.2	.1	.1	.3	.2	.2
% Variance	2.2[c]	2.4[c]	.8[c]	1.9[c]	---	.7[c]	.5	.9[c]	.3[a]
High IQ									
Mean	3.0	3.0	2.8	3.0	2.8	3.4	2.5	3.7	3.5
Difference	.4	.5	.4	.3	.3	.3	.5	.3	.2
% Variance	6.0[c]	6.4[c]	4.5[c]	4.2[c]	2.3[c]	3.0[c]	4.0[c]	2.3[c]	1.3[c]
Low IQ									
Mean	2.2	2.2	2.2	2.2	2.3	2.9	1.8	2.9	2.7
Difference	.2	.2	.1	.2	.0	.1	.2	.3	.3
% Variance	4.3[c]	4.1[c]	1.2[c]	2.3[c]	---	1.4[c]	2.2[a]	1.9[c]	.7[b]

(continued)

Table 12 (continued)

Group	English	Social Studies	Science	Mathematics	Business	Vocational	Foreign Language	Music	Art
White Males									
Mean	2.4	2.5	2.4	2.4	2.3	3.1	2.0	3.1	2.9
Difference	.4	.4	.3	.4	.3	.2	.5	.3	.2
% Variance	5.0[c]	4.3[c]	1.9[c]	3.9[c]	1.1[a]	1.3[c]	2.2[c]	2.0[c]	.6[b]
White Females									
Mean	3.0	3.0	2.8	3.0	2.9	3.4	2..	3.8	3.6
Difference	.3	.3	.3	.2	.1	.2	.4	.3	.3
% Variance	4.5[c]	4.9[c]	3.2[c]	2.1[c]	.8[b]	2.5[c]	4.0[c]	2.5[c]	1.7[c]
Negro Males									
Mean	2.2	2.2	2.2	2.1	---	3.0	---	2.5	2.9
Difference	.2	.2	.2	.3	---	.1	---	.3	.1
% Variance	2.1[a]	2.3[a]	---	2.1[a]	---	2.6[a]	---	3.4[b]	---
Negro Females									
Mean	2.6	2.6	2.6	2.2	---	2.9	---	3.2	3.3
Difference	.4	.4	.4	.6	---	.4	---	.3	.2
% Variance	---	2.8[a]	3.1[a]	2.8[a]	---	2.7[a]	---	---	---

Note.--Percentage of variance figures omitted where differences were not statistically significant. All figures omitted where N of underachievers not large enough for valid comparison.

[a] $p < .05$

[b] $p < .01$

[c] $p < .001$

the trend of means was the same as for significant comparisons, with underachievers performing below average achievers. One exception was in the business course area GPA, where the mean performance of low IQ underachievers was equal to that of average achievers. In the white male and white female samples, underachievers obtained significantly lower GPA's than average and overachievers in all elective course areas. Similar trends were found in the Negro male and Negro female samples; however, all differences were not significant.[23]

Because some courses were elective or corresponded to a curriculum, it was possible that choice of courses was related to SES level, IQ level, race,or sex. For example, a higher percentage of high SES level or high IQ level students would be expected to elect the academic curriculum in preparation for college, and,consequently,a lower percentage may have taken business or vocational courses. It would add to the interpretation of differences found in the performarce of underachievers in specific groups if they also showed a different pattern of course selection than average and overachievers. To obtain an estimate of course area preference, the percentage of subjects in each achievement group who elected to take courses

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[23] Only one Negro male underachiever and one Negro female underachiever took a foreign language course, and only one Negro male underachiever took a business course. Although these single individuals performed as well or better than average achievers, a valid comparison of the performance with the other groups could not be made.

in the areas of business, vocational, foreign languages, music, and art was calculated. These figures are presented in Table 13.[24] The percentage of subjects taking particular courses does not reflect only the differential selection of course areas by subjects in school. It was also possible that a number of drop-outs or transfers avoided taking courses in some areas up to the grade of withdrawal. This possibility was particularly suggested by the finding that only 89% of the combined sample had a science grade point average, although two units of science were required for graduation. In the other three areas where subgroups differed in selection of courses, 54% of the combined samples took business courses, 39% took foreign language courses, and 93% took art courses.

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[24]The base N used to calculate these percentages was the total number of subjects in each group for whom secondary school grade point averages were available, i.e., the number of subjects with GPA's in the required course areas. This excluded from comparisons subjects whose secondary school grades were missing in their records and subjects who transferred out of the school system between the 6th and 7th grades. The percentage of subjects taking courses in English, social studies, and mathematics was 100% by virtue of the fact that this number of subjects was used as the basis for the calculations. These courses are omitted from the Table. Ninety-nine percent of the subjects took physical education, vocational, and music courses, and there were no differences of note across any of the subgroups compared. Therefore, these course areas have also been eliminated from the Table. To further simplify the presentation of figures in Table 13, the percentages for achievement groups have been omitted if the difference among achievement groups was not greater than 2%.

Table 13

Percentage of Groups With Course Area GPA's in Science, Business, Foreign Languages, and Art

Group	Science	Business	Foreign Language	Art
Combined Samples (N=3307)	89	54	39	93
High SES (N=1372)	88	54	56	93
Underachievers (N=178)	--	50	44	94
Average Achievers (N=934)	--	55	57	93
Overachievers (N=260)	--	52	60	90
Low SES (N=1852)	90	55	27	94
Underachievers (N=302)	--	53	21	--
Average Achievers (N=1314)	--	56	27	--
Overachievers (N=236)	--	53	35	--
High IQ (N=1959)	91	59	54	92
Underachievers (N=295)	--	60	40	96
Average Achievers (N=1364)	--	61	55	92
Overachievers (N=300)	--	52	62	90
Low IQ (N=1348)	86	46	18	95
Underachievers (N=195)	81	40	14	93
Average Achievers (N=945)	86	46	16	96
Overachievers (N=208)	87	51	28	95
White Males (N=1468)	87	43	46	92
Underachievers (N=224)	84	40	35	94
Average Achievers (N=1007)	88	43	47	93
Overachievers (N=237)	88	46	53	89
White Females (N=1450)	90	72	38	93
Underachievers (N=224)	--	69	28	93
Average Achievers (N=1013)	--	74	39	92
Overachievers (N=213)	--	65	94	48

(continued)

Table 13 (continued)

Group	Science	Business	Foreign Language	Art
Negro Males (N=214)	90	18	14	99
Underachievers (N=24)	88	4[a]	4[a]	96
Average Achievers (N=157)	90	17	14	99
Overachievers (N=33)	91	30	24	100
Negro Females (N=175)	94	42	17	9[illegible]
Underachievers (N=18)	100	22	6[a]	--
Average Achievers (N=132)	95	48	14	--
Overachievers (N=25)	88	20	36	--

Note.--Percentages based on number of subjects with GPA's in English, Social Studies, and Mathematics course areas.

[a] Percentage represents one subject.

The percentage of subjects in the high SES and low SES levels who took science, business, and art courses did not differ greatly. There was considerable difference, however, in the area of foreign languages; 56% of high SES subjects compared to 27% of low SES subjects took one or more foreign language courses. Comparison of the course selection of high IQ level and low IQ level subjects showed a higher percentage of high IQ level subjects than low IQ level subjects electing business and foreign language courses, and a higher percentage of low IQ level subjects than high IQ level subjects electing art courses. A higher percentage of low IQ level subjects also avoided taking a course in the science area.

Comparison of the percentage of subjects electing courses in different areas in the race and sex samples revealed three distinctive differences. First, a higher percentage of girls than boys elected courses in the business area. Second, the avoidance of science courses was greatest in the white male samples. Third, a much lower percentage of subjects in the Negro samples took courses in foreign languages than did subjects in white samples.

Comparison of the reading achievement groups in the selection or avoidance of particular course areas showed several different patterns. A much lower percentage of under-achievers than average or overachievers elected courses in the foreign language area in all samples and stratifications. The

most marked difference was in the white female sample, where only 28% of the underachievers had a foreign language grade point averages compared to 94% of the white female overachievers. There was a very strong relationship of reading achievement and IQ level to the selection of foreign language courses. High IQ overachievers most often took courses in this area (62%), and low IQ underachievers least often took them (14%). The percentages in other achievement groups were in direct relationship to reading achievement level within IQ level. This same pattern was also found across achievement groups within SES stratifications.

The selection of business courses by achievement groups in the high and low IQ levels was different from that found for foreign languages. In the low IQ level, more overachievers selected business courses (51%) than average or underachievers (40%). In the high IQ level, the opposite trend appeared; fewer overachievers (52%) selected business courses than average (61%) or underachievers (60%). In both high and low SES stratifications the highest percentage of subjects electing business courses were average achievers.

In the high IQ level, a higher percentage of underachievers selected art courses than did average or overachievers. In contrast, fewer underachievers in the low IQ level selected art courses.

An additional characteristic of low IQ underachievers was that this group had a lower percentage of GPA's than average and overachievers in all four course areas shown in Table 13. This suggested that many low IQ underachievers, rather than selecting some course areas over others, avoided taking any course that was not required. Although the number of courses that entered into a GPA was not calculated, the lower percentage figures in the low IQ level, particularly for low IQ underachievers, also suggested that these groups did not sample as wide a range of course areas as their high IQ counterparts and, for those students who remained in school, there must have been a higher concentration of courses within one particular area.

To a lesser degree, the more limited range of courses also characterized underachievers in other groups. With the exception of the high IQ level, an overrepresentation of underachievers appeared in only one of the four course areas, art. High IQ underachievers, in addition to showing an overrepresentation in selection of art courses, had as high a percentage as average achievers in the business area.

Comparison of the difference in GPA of under- and average achievers and the percentage of variance accounted for across the three achievement groups (Table 12) with the patterns of course selection, showed the following relationships:

1. In the area of science and business, where a lower percentage of underachievers took courses, the mean performance

of underachievers was closer to that of average achievers. For example, the mean performance of low IQ underachievers was only .1 grade scores below average achievers in the science area, compared to .2 grade scores in other required course areas. The better performance of underachievers in these areas resulted from negative selection, and, since it is possible that underachievers who avoided these courses were on the bottom of the achievement continuum, there is not definite information about compensative skills of underachievers in reading.

2. In the area of art courses and, for high IQ under-achievers, business courses, there was evidence of positive selection. In these areas a higher percentage of underachievers took courses than average or overachievers, and their mean performance was closer to that of other achievement groups.

3. In the area of foreign languages, negative selection by underachievers was the greatest. Only 30% (combined samples) took courses in this area, and most of these subjects were in the high IQ or high SES levels. The strong relationship of underachievement in reading to performance in foreign languages was evident in that the mean performance of the small number of underachievers who elected these courses was lower than the performance of underachievers in any other area.

Standardized Test Performance. The 6th grade CAT Language and Arithmetic subtests and the 7th grade SAT Language and Arithmetic

subtests were administered with the reading subtests covered in a previous section of this report. When achievement groups in the combined samples were compared on these tests (Part I), the performance of underachievers was significantly lower than that of average achievers and below normative grade placement on all subtests. Underachievers showed a greater deficit on the language subtests than on the arithmetic subtests.

The mean performance of achievement groups in the race-by-sex samples and IQ and SES stratifications on the 6th and 7th grade language test are presented in Table 14. Comparable data for the two arithmetic tests are presented in Table 15. In both language and arithmetic test performance in the 6th grade, differences among achievement groups were significant ($p < .001$) in all comparisons, with underachievers showing the lowest level of performance. Achievement groups also differed significantly in performance on the 7th SAT Language and Arithmetic subtests in all comparisons except in the Negro female sample. The trend of means, however, was the same in the Negro female sample, with underachievers performing at a lower level than average achievers.

The gain in language placement from grade 6 to grade 7 was only .2 grade units in the combined samples. This was considerably less than expected, even considering differences in the content and normative samples of the two tests. An additional factor that could affect language test performance would be a de-emphasis on the development of language skills in the 6th or 7th

Table 14

Mean Language Test Performance and Gain From Grades 6 to 7 of Under-, Average, and Overachievers

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined Samples	6th CAT	5.51	6.07	6.50	128.46[b]	6.62
	7th SAT	5.20	6.25	7.19	77.90[b]	4.85
	Gain	- .31	.18	.69		
High SES	6th CAT	5.75	6.41	6.71	63.52[b]	7.85
	7th SAT	5.70	7.11	7.87	40.50[b]	5.73
	Gain	- .05	.70	1.16		
Low SES	6th CAT	5.39	5.84	6.22	46.95[b]	4.53
	7th SAT	4.94	5.64	6.46	28.20[b]	3.17
	Gain	- .45	- .20	.24		
High IQ	6th CAT	6.10	6.60	7.03	129.28[b]	10.78
	7th SAT	5.99	7.34	8.46	97.48[b]	9.34
	Gain	- .11	.74	1.43		
Low IQ	6th CAT	4.68	5.29	5.74	87.19[b]	10.50
	7th SAT	3.79	4.50	5.22	29.21[b]	4.69
	Gain	- .89	- .79	- .52		
White Males	6th CAT	5.32	5.91	6.33	65.80[b]	7.48
	7th SAT	4.79	5.91	6.71	35.49[b]	4.88
	Gain	- .53	.00	.38		
White Females	6th CAT	5.89	6.45	6.86	69.68[b]	8.05
	7th SAT	5.78	6.94	8.16	54.13[b]	7.06
	Gain	- .11	.49	1.30		
Negro Males	6th CAT	4.59	4.96	5.69	15.97[b]	11.61
	7th SAT	3.63	4.03	4.70	3.69[a]	3.47
	Gain	- .96	- .93	- .99		
Negro Females	6th CAT	4.78	5.61	6.11	13.07[b]	11.06
	7th SAT	4.21	5.01	5.54	2.20	1.87
	Gain	- .57	- .60	- .57		

Note.--Gain expected for norm grade placement of tests: 1.10 (SAT modal-age norms) and .60 (SAT total-group norms).

[a] $p < .05$

[b] $p < .001$

Table 15

Mean Arithmetic Test Performance and Gain From Grades 6 to 7 of Under-, Average, and Overachievers

Group		Under-achievers	Average achievers	Over-achievers	F	omega^2
Combined Samples	6th CAT	5.69	6.04	6.36	85.96[b]	4.49
	7th SAT	6.18	6.60	6.97	41.68[b]	2.56
	Gain	.49	.56	.61		
High SES	6th CAT	5.89	6.34	6.50	38.85[b]	4.89
	7th SAT	6.52	7.11	7.31	19.32[b]	2.73
	Gain	.63	.77	.81		
Low SES	6th CAT	5.59	5.85	6.17	32.26[b]	3.11
	7th SAT	5.99	6.26	6.60	15.36[b]	1.64
	Gain	.40	.41	.43		
High IQ	6th CAT	6.13	6.47	6.76	83.95[b]	7.20
	7th SAT	6.67	7.23	7.67	55.54[b]	5.50
	Gain	.54	.76	.91		
Low IQ	6th CAT	5.04	5.42	5.76	53.59[b]	6.65
	7th SAT	5.41	5.62	5.93	12.89[b]	1.90
	Gain	.37	.20	.17		
White Males	6th CAT	5.67	6.08	6.35	41.77[b]	4.83
	7th SAT	6.14	6.70	7.04	24.16[b]	3.20
	Gain	.47	.62	.69		
White Females	6th CAT	5.88	6.22	6.50	41.16[b]	4.83
	7th SAT	6.40	6.81	7.18	21.93[b]	2.91
	Gain	.52	.59	.68		
Negro Males	6th CAT	4.84	5.15	5.73	12.84[b]	9.34
	7th SAT	4.94	5.14	5.72	4.42[a]	3.82
	Gain	.10	- .01	- .01		
Negro Females	6th CAT	4.77	5.41	5.91	10.96[b]	9.31
	7th SAT	4.95	5.43	5.50	1.44	.65
	Gain	.18	.02	- .41		

Note.--Gain expected for norm grade placement of tests: 1.10 (SAT modal-age norms) and .60 (SAT total-group norms).

[a] $p < .05$

[b] $p < .001$

grade curriculum. It should be emphasized, however, that regardless of causes for the small gain, assessment of the relative performance of achievement groups remains valid in that all groups were subject to the same conditions. In addition to remaining significantly below average achievers, underachievers in all samples and stratifications showed a loss in language grade placement from grade 6 to grade 7. A loss rather than gain in language placement was also found in the low IQ level (all achievement groups) and in the Negro samples. The relationship of initial standing, i.e., mean performance in the 6th grade, to amount of gain was also clearly present. Across the six achievement groups in the high and low IQ levels (or in the SES levels), the rank order correlation of 6th grade performance level to gain was 1.00.

In 6th and 7th grade arithmetic test performance, there was also a relationship of gain to 6th grade score, however, not as consistent or strong a relationship as with the language test performance. Exceptions were in the low IQ level, where underachievers showed a greater gain than average achievers, and in the Negro male and Negro female samples, where average and overachievers showed loss or very little gain and underachievers showed a mean gain from grade 6 to 7.[25]

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[25] It should be emphasized again that the pattern of performance in the low IQ group does not solely reflect the pattern in the Negro male and Negro female samples. Examination of scores of low IQ level white males and white females showed the same pattern of performance, very little gain in all achievement groups and a slightly higher gain for underachievers than for average or overachievers.

The relationship of gain to initial standing in arithmetic and language test performance points to the same conclusion as reached in examining the reading test scores. Deficiencies in these areas compound over successive grades and result in an increased deficiency relative to grade placement for groups performing at low levels in the 6th grade.

When the performance of underachievers, average achievers, and overachievers in the combined samples was compared on the 9th grade ITED, it was found that underachievers in reading were performing significantly below average and overachievers on all subtests. The percentage of variance among achievement groups accounted for by the different subtests indicated that underachievers were the least different from average achievers on the subtests of Quantitative Thinking and Natural Sciences Background. The greatest differences between under- and average achievers occurred on the subtests of Vocabulary, Literary Materials, Social Studies Reading, and Natural Sciences Reading.

Comparison of achievement groups in the high and low SES levels and in the high and low IQ levels produced the same results. The mean performance of underachievers was significantly below that of average and overachievers in each of these stratifications ($p < .001$), and the percentage of variance accounted for across groups indicated that underachievers were most different from average achievers on the subtests most related to reading and were least different on the Natural Sciences Background and Quantitative Thinking subtests.

The mean performance (in standard scores) and the norm percentile rank of the mean for the achievement groups in the race-by-sex samples are presented in Table 16. On all subtests the mean percentile rank of underachievers was lower than that of average achievers except for Test 9 in the Negro male sample. Although there were not significant differences among the achievement groups on some other subtests in the Negro male and Negro female samples, trends were toward overachievers having the highest mean and underachievers having the lowest mean. The performance of female underachievers was generally higher than the male underachievers, as on other achievement measures. It is of note, however, that this was not true on all subtests. The mean percentile rank of male underachievers in both races was higher on the subtests of Basic Social Concepts and Quantitative Thinking than that of female underachievers. White male underachievers also had a higher mean percentile rank on Natural Science Background than white female underachievers and white female average achievers.

Grade Retention in Secondary School

Nonpromotion in secondary school can be considered as a gross measure of academic achievement in that it represents failure in a sufficient number of courses to require a student to repeat a grade. In the total sample, it was found that a significantly

Table 16

Mean Performance and Norm Percentile Rank of Under-, Average, and Overachievers in Reading in 9th Grade ITED

Test[a]	Underachievers M	Underachievers Percentile Rank	Average Achievers M	Average Achievers Percentile Rank	Overachievers M	Overachievers Percentile Rank	F	omega^2
			WHITE MALE SAMPLE					
1	10.9	41	13.4	60	14.8	70	21.41[d]	3.54
2	13.0	57	15.2	71	16.3	77	13.10[d]	2.15
3	10.5	38	12.7	55	14.1	66	24.29[d]	3.99
4	13.0	68	14.8	78	16.5	84	14.46[d]	2.35
5	11.2	49	13.9	66	15.7	75	29.11[d]	4.79
6	10.4	47	13.0	64	14.3	71	18.86[d]	3.08
7	8.7	36	11.6	56	13.2	66	28.65[d]	4.70
8	10.9	45	13.7	63	15.5	73	32.83[d]	5.36
9	11.0	50	13.6	66	15.0	75	22.53[d]	3.72
			WHITE FEMALE SAMPLE					
1	10.3	36	12.2	51	14.4	67	28.37[d]	4.42
2	10.5	41	12.8	56	15.0	70	30.47[d]	4.79
3	13.3	60	14.9	71	16.9	83	26.05[d]	4.08
4	11.8	59	13.0	68	14.2	75	7.58[d]	1.11
5	11.8	53	13.8	66	16.0	77	31.01[d]	4.89
6	10.6	48	12.3	59	15.1	76	31.92[d]	5.00
7	10.5	48	13.1	65	15.4	78	36.74[d]	5.76
8	11.9	52	14.2	66	16.8	80	38.31[d]	5.99
9	12.2	58	14.2	70	16.9	83	31.84[d]	5.04
			NEGRO MALE SAMPLE					
1	7.1	18	7.3	19	8.7	26	1.55	0.71
2	4.8	10	7.2	22	9.0	32	5.88[c]	5.68
3	6.3	14	7.1	17	9.2	30	3.97[b]	3.51
4	6.6	23	6.9	24	6.5	22	0.13	0.00
5	5.2	5	7.5	20	8.9	32	7.88[d]	7.87
6	5.5	14	7.0	22	8.2	29	2.16	1.42
7	4.5	13	4.8	15	6.7	23	3.91[b]	3.56
8	4.4	8	6.5	16	8.2	26	5.98[c]	5.90
9	6.4	19	6.3	18	6.7	21	0.11	0.00

(continued)

Table 16 (continued)

Test[a]	Underachievers M	Underachievers Percentile Rank	Average Achievers M	Average Achievers Percentile Rank	Overachievers M	Overachievers Percentile Rank	F	omega^2
			NEGRO FEMALE SAMPLE					
1	6.1	13	7.3	19	8.9	27	2.71	2.35
2	4.9	10	7.0	21	6.6	19	2.10	1.50
3	8.0	23	9.9	34	12.7	55	5.88[c]	6.31
4	4.4	14	6.5	22	6.6	23	2.20	1.66
5	7.7	22	8.4	28	11.5	51	6.53[d]	7.23
6	5.6	14	6.8	20	8.1	28	1.46	0.65
7	4.5	13	6.8	24	9.8	44	8.42[d]	9.41
8	7.4	21	7.6	22	10.1	39	4.06[b]	4.22
9	6.8	22	7.9	29	10.9	49	5.82[c]	6.53

Note.--Means are expressed in standard scores. Ns and standard deviations are presented in the Appendix.

[a]Test 1: Understanding of Basic Social Concepts
Test 2: General Background in the Natural Sciences
Test 3: Correctness and Appropriateness of Expression
Test 4: Ability to Do Quantitative Thinking
Test 5: Ability to Interpret Reading Materials in the Social Studies
Test 6: Ability to Interpret Reading Materials in the Natural Sciences
Test 7: Ability to Interpret Literary Materials
Test 8: General Vocabulary
Test 9: Use of Sources of Information

[b]$p < .05$

[c]$p < .01$

[d]$p < .001$

larger percentage of underachievers than average or overachievers were retained in secondary school grades (Part I).

Comparison of the achievement groups in the high and low SES and IQ stratifications showed the same relationships that were found in the combined samples, and as characteristic of other achievement measures, there was a strong relationship of both IQ level and SES level to retention in secondary school. For low IQ level students, the incidence of retention was more than 20% above that among high IQ level students (Table 17). The relationship of reading achievement to retention was greater in the low IQ and SES stratifications than in the high stratifications. In the low IQ level, 41% of the underachievers were retained in a secondary school grade, 10% more than average achievers and 20% more than overachievers. Among high IQ underachievers the retention rate was less than that for low IQ overachievers but significantly greater than that for high IQ average and overachievers. The same pattern was found in the high and low SES levels; however, differences across achievement groups were not as great as in the IQ stratifications.

In the white male and white female samples a significantly greater percentage of underachievers were retained than average and overachievers. In the Negro samples, a higher percentage of underachievers were retained; however, the differences among groups were not statistically significant. More males of both

Table 17

Percentage of Under-, Average, and Overachievers
Retained in Grades 7 Through 12

		Under-achievers	Average achievers	Over-achievers	X^2
Combined Samples	N	118	412	62	24.35[c]
	%	23.4	17.3	11.7	
High SES	N	28	90	20	8.08[a]
	%	15.2	9.4	7.4	
Low SES	N	87	301	39	12.08[b]
	%	28.3	22.2	15.9	
High IQ	N	36	124	19	6.63[a]
	%	11.8	8.7	6.0	
Low IQ	N	82	288	43	20.58[c]
	%	40.8	30.3	20.3	
White Males	N	72	238	37	17.53[c]
	%	31.2	22.9	15.0	
White Females	N	34	106	14	9.07[a]
	%	14.9	10.2	6.4	
Negro Males	N	8	48	7	1.28
	%	29.6	29.3	20.0	
Negro Females	N	4	20	4	.56
	%	21.0	14.5	16.0	

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

races were retained than females, and similar to the difference between sexes in grade point averages, the percentage of male overachievers retained in grade was the same as the percentage of female underachievers who were retained.

Measures of Later Behavior and Outcome

In Part I, achievement groups in the combined samples were compared on mean days absent in secondary school grades, the number of school activities in which a student participated in grades 7 to 10, and on high school dropout rate. High school graduates were also compared on attendance in school, college, or university vs. employment a year following graduation. Findings indicated that the three achievement groups differed very little in the mean number of days absent, and differences were not statistically significant in any secondary school grade. A higher percentage of underachievers than average or overachievers were found to have no participation in school activities indicated on their secondary school records; however, only the difference in the 7th grade was statistically significant. It was also found that a significantly greater percentage of underachievers became high school dropouts, and significantly fewer underachievers who graduated from high school continued their education in technical school, college, or university.

Absence. Achievement groups in the four race-by-sex samples did not differ significantly in number of days absent in any

secondary school grade. On the basis of these negative findings, comparisons were not made in the SES and IQ groups.

Participation in School Activities. Comparison of achievement groups on the number of school activities in grades 7 through 10 showed a general trend in SES and IQ groups and race-by-sex samples, suggesting that underachievers in reading had no participation in school activities more often than average and overachievers. Very few of the differences between achievement groups, however, were statistically significant, and, where significant differences did appear, they were not consistently in a particular grade. There was some indication that lack of participation in activities was more characteristic of underachievers in the high IQ level (Table 18). The difference between high IQ level under-, average, and over-achievers was significant in the 7th grade ($p < .01$), 9th grade ($p < .05$), and approached significance in the 10th grade ($p < .10$).

One exception to the trend of greater participation of average and overachievers was in the Negro male sample, where a significantly greater number of overachievers did not participate in school activities in grade 10 (Table 19). The general trends in the data and significant differences among high IQ groups suggest that the effects of underachievement in reading on later participation in school activities may merit further investigation. Since these findings were based on a purely quantitative count of activities and did not take into account the type of activities that students

Table 18

Percentage of Under-, Average, and Overachievers in High and Low SES and IQ Levels With No Participation in School Activities Indicated on Secondary School Records

	Grade	Under-achievers	Average achievers	Over-achievers	Significance level of X^2
High SES	7	36.0	29.7	27.9	
	8	30.5	29.5	25.2	
	9	34.5	30.9	29.8	
	10	44.5	44.4	43.7	
Low SES	7	35.4	31.2	29.7	
	8	35.2	32.2	31.4	
	9	39.8	35.2	31.3	
	10	52.0	46.0	48.9	
High IQ	7	36.5	27.7	26.4	$p < .01$
	8	31.9	29.5	28.9	
	9	36.9	30.2	26.0	$p < .05$
	10	49.0	41.4	41.3	$p < .10$
Low IQ	7	35.9	35.3	31.5	
	8	35.5	33.8	28.5	
	9	39.6	38.5	36.4	
	10	59.5	53.8	56.1	

Note.--Chi square based on 2 x 3 table of achievement groups and participation vs. no participation frequencies.

Table 19

Percentage of Under-, Average, and Overachievers in Race-by-Sex Samples With No Participation in School Activities Indicated on Secondary School Records

	Grade	Under-achievers	Average achievers	Over-achievers	Significance level of X^2
White Males	7	41.5	34.3	29.2	$p < .05$
	8	37.9	33.5	30.6	
	9	35.8	38.5	37.4	
	10	58.3	53.9	52.3	
White Females	7	35.6	34.0	32.7	
	8	31.0	35.1	29.1	
	9	41.2	35.1	27.0	$p < .001$
	10	49.2	43.9	47.1	
Negro Males	7	16.0	7.6	8.6	
	8	16.7	5.6	21.9	$p < .01$
	9	23.5	9.7	6.7	
	10	23.1	22.5	20.0	
Negro Females	7	6.2	7.1	12.5	
	8	28.6	14.1	17.4	
	9	33.3	8.8	12.5	$p < .05$
	10	50.0	20.8	21.4	

Note.--Chi square based on 2 x 3 table of achievement groups and participation vs. no participation frequencies.

participated in, some differences between achievement groups may have been obscured. The finding of a strong relationship between the 6th grade IQ score with later achievement and the greater relationship of underachievement to participation in activities among high IQ students suggested that more high IQ underachievers had a recognition of their potential to succeed academically and perhaps more motivation to achieve. Participation in extra-curricular activities by these students may have been sacrificed more often than by others in order to devote the added time to studies necessitated by their poor reading skills.

Dropout or Graduation. In the total sample, 38% of the subjects transferred out of the school system between grades 7 and 12, with resulting loss of information on their eventual dropout or graduation from high school. Of the remaining 2,843 subjects, 73% were known to have graduated from high school, and 27% were known to have dropped out prior to completing the 12th grade. There was a significant difference ($p < .001$) in the drop-cut rate of the three achievement groups in the combined samples; 32% of the underachievers left school prior to graduation compared to 27% of the average achievers and 20% of overachievers. Although this indicated a definite relationship between underachievement in reading in elementary school and later graduation from high school, the difference in the dropout rate across achievement groups was small and only accounted for 0.5% of the variance across groups.

Comparisons were made among the achievement groups in high and low SES and IQ stratifications and the race-by-sex samples

to determine whether the relationship of underachievement in reading to high school dropout differed in these groups. These data are presented in Table 20.

A strong relationship between SES level and high school graduation was found. Among high SES students, 86% were graduates, compared to only 67% of low SES students. The relationship between IQ level and dropout was even stronger. In the high IQ group, 87% of the subjects graduated, compared to only 56% of the low IQ subjects. In both high and low SES and IQ levels, a lower percentage of underachievers than average or overachievers graduated; however, the difference among achievement groups was only significant in the low IQ level ($p < .001$).

Although consistent trends in all groups indicated there was a relationship of reading achievement to high school dropout that was independent of SES and IQ level, the effect was significant only in combination with lower IQ performance. Underachievement in the high IQ or SES levels was clearly associated with lower achievement but indicated only a slightly higher probability of not completing high school. The findings also indicated that IQ and SES level were more powerful predictors of high school dropout or graduation than the reading achievement classification alone. In the low IQ level, where the differences among achievement groups were the greatest, the dropout rate of underachievers was almost 10% more than that of average achievers. In comparison, the difference in dropout rate between high

Table 20

Percentage of High School Graduates Among Under-,Average, and Overachievers in Combined Samples, High and Low SES and IQ Level, and Race and Sex Samples

		Under-achievers	Average achievers	Over-achievers	F
Combined Samples (N=2843)	N	287	1456	335	7.73[c]
	%	67.8	72.8	79.8	
High SES (N=1120)	N	120	655	184	1.68
	%	82.2	85.3	89.3	
Low SES (N=1651)	N	167	791	149	2.53
	%	62.5	67.1	72.7	
High IQ (N=1653)	N	212	1001	219	1.46
	%	83.8	86.7	89.4	
Low IQ (N=1190)	N	78	468	120	9.02[c]
	%	45.9	55.4	68.6	
White Males (N=1244)	N	123	606	157	4.72[b]
	%	64.6	71.1	79.0	
White Females (N=1234)	N	148	694	149	3.22[a]
	%	77.3	80.6	87.9	
Negro Males (N=201)	N	10	83	19	.82
	%	45.5	55.7	63.3	
Negro Females (N=154)	N	6	73	10	1.11
	%	40.0	60.7	58.8	

Note.--Mean differences on a dichotomous group membership variable used to test significance of differences. Transfers out of school system not included in comparisons.

[a] $p < .05$
[b] $p < .01$
[c] $p < .001$

and low SES average achievers was 18%, and between high and low IQ average achievers was 31%![26]

There was a lower percentage of graduates among underachievers in each of the race-by-sex groups; however, differences were only significant in the white male and white female samples. In agreement with the above findings, significant differences resulted largely from the greater dropout rate among low IQ level subjects. The dropout rate was much higher in the Negro samples than in the white samples and was higher for males than for females in both races. In both Negro samples, less than half of the underachievers graduated from high school; however, the percentage of graduates among average achievers was also low, 56% for Negro males and 61% for Negro females.[27]

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[26] In a previous study (Lloyd, 1967), it was found that socio-economic measures and achievement measures independently predict dropout or graduation from high school in this population; so, the difference between high and low IQ levels in dropout rate does not account for all the difference between high and low SES levels.

[27] The similarity between the figures for the Negro male sample and the low IQ stratification may be noted. It is important to emphasize again that although the majority of subjects in the Negro samples fell into the low IQ stratification (78%), these subjects constituted only 24% of the low IQ group. Data for white students in the low IQ range were similar to those of the Negro samples. Among low IQ white males, 43% of the under-achievers, 49.4% of the average achievers, and 66.3% of the overachievers graduated. Among low IQ white females, 54.7% of the underachievers, 65.6% of the average achievers, and 80.4% of the overachievers graduated.

Work or Further Training After Graduation. Follow-up information from counselor records in the year following graduation was available for 1,129 of the high school graduates (54% of the total number of graduates). In the combined samples, it was found that 69% of the graduates on whom information was available were attending a school, college, or university in the year following graduation (average achievers). In contrast, only 57% of the underachievers were found to be continuing educational training; a significantly lower percentage than for average achievers ($p < .001$).

Data from the follow-up information for achievement groups in the SES and IQ stratifications and in race-by-sex samples is presented in Table 21. As would be expected, continuation of training after high school graduation was associated with high SES and high IQ levels. Eighty-three percent of the high SES graduates and 77% of high IQ graduates continued educational training. The difference between graduates in the high and low SES levels and high and low IQ levels who continued educational training was 26%.

Fewer underachievers,than average or overachievers,continued their education beyond high school in all groups. Differences across achievement groups were significant, however, only in the high SES, high IQ, and white female groups. In the high SES level, 18% fewer underachievers than average achievers continued their education.

Table 21

Follow-up Information on Graduate Under-, Average, and Overachievers

	Under-achievers		Average achievers		Over-achievers		X^2
	N	%	N	%	N	%	
HIGH SES							
School	42	62.7	355	81.0	124	89.2	18.77[b]
Work	22	32.8	75	17.1	13	9.4	
LOW SES							
School	36	52.9	193	54.8	30	53.6	0.20
Work	30	44.1	144	40.9	24	42.9	
HIGH IQ							
School	66	61.1	477	74.9	125	84.5	15.71[b]
Work	36	33.3	146	22.9	20	13.5	
LOW IQ							
School	12	41.4	73	45.9	30	62.5	4.41
Work	17	58.6	76	47.8	17	35.4	
WHITE MALE SAMPLE							
School	37	64.9	264	79.3	79	83.2	5.64
Work	18	31.6	67	20.1	16	16.8	
WHITE FEMALE SAMPLE							
School	38	53.5	256	65.8	69	79.3	10.71[a]
Work	29	40.8	114	29.3	16	18.4	

(continued)

Table 21 (continued)

	Under-achievers		Average achievers		Over-achievers		X^2
	N	%	N	%	N	%	
			NEGRO MALE SAMPLE				
School	2	28.6	15	32.6	4	44.4	0.48
Work	5	71.4	29	63.0	5	55.6	
			NEGRO FEMALE SAMPLE				
School	1	50.0	15	53.6	3	60.0	2.28
Work	1	50.0	12	42.9	0	0.0	

Note.--Schools include attendance at university, college, business or vocational school. Subjects who were neither attending school nor employed not included in table. They constitute the difference between the sum of percentages and 100% in each group. Over-all 4% of underachievers, 3% of average achievers, and 2% of overachievers were neither working nor attending school.

[a] $p < .01$

[b] $p < .001$

In the high IQ level, 14% fewer underachievers than average achievers continued education or training.[28]

SES level was more predictive of work or training following graduation than IQ level, in contrast to findings related to level of achievement in school. This can be seen in the range of percentages across the six achievement groups from low to high. In the SES

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[28] Differences in the completeness of follow-up information in the different groups must be considered in evaluating the differences among groups. In the white male, white female, and Negro male samples, the percentage of graduates with follow-up information was approximately the same as that for the combined samples (54%). In the Negro female sample, 39% had follow-up information. A much higher percentage of subjects in the high SES and high IQ groups had follow-up information than in the comparable low groups. Information was available on 67% of the high SES graduates, compared to 43% in the low SES level, and 62% in the high IQ level compared to 35% in the low IQ level. Although there was no way to test whether follow-up was more complete for subjects in training than in the work force, the data sources suggested that information on training was more likely to have been obtained. Location of subjects attending school was facilitated by the availability of school enrollment lists, whereas subjects in the work force had to be located through mail questionnaires. Therefore, the percentage of subjects continuing their training was probably more reliable than that for subjects in the work force.

In most cases, follow-up information was also more complete for average and overachievers than for underachievers. In the two groups, where the percentage of follow-up information for underachievers was greater (the low IQ level and the Negro male sample), more than half of the graduates in these underachievement groups were employed rather than continuing educational training. This suggested that the relationship of underachievement to work rather than continued training may be stronger than indicated in our data. In this regard, the higher high school dropout rate of underachievers also must be considered. The majority of underachievers who did not complete high school would also be expected to enter the work force rather than continue training.

stratification there was no overlap between achievement groups in the high and low levels. A higher percentage of high SES underachievers (62.7%) continued training than did low SES overachievers (53.6%). In the IQ stratification, slightly more low IQ overachievers continued training (62.5%) than did high IQ underachievers (61.1%).

Discussion and Summary

The purpose of dividing the sample into subgroups based on the major variables of IQ, SES, race, and sex was to determine whether the effects of underachievement in reading were modified in groups differing in these characteristics. Differences that were found were small and were generally overshadowed by the consistent pattern reflected in all groups, i.e., that underachievers in the 6th grade performed at a lower level than average achievers on standardized tests, course marks, and other measures of achievement all through secondary school.

Although the primary focus was on the problems of underachievers within the different groups, secondary findings on the relationships of IQ level and SES level to achievement also merit discussion. First, both 6th grade IQ score and SES level were highly predictive of later performance in high school, graduation from high school, and training after graduation. High IQ average achievers placed one or more years higher on standardized tests than low IQ average achievers and received course marks that averaged one or more letter

grades higher. The percentage of high IQ average achievers graduating from high school was 30% higher, and among graduates, 30% more continued their training after high school than low IQ average achievers.

The relationship of SES level to school achievement was similar to that of IQ; however, differences in performance of high and low groups were not as great. Thus, IQ score was a better predictor of later achievement than SES level. In one comparison, high and low SES groups were more widely separated than high and low IQ groups. This was in the percentage of high school graduates who continued training (college, business, or vocational school) after graduation. Parents' educational and occupational level were therefore better predictors of the child's educational and occupational level beyond high school than the test of general mental ability when the range of achievement was restricted to those who successfully completed high school. In connection with this finding, it should be remembered that the follow-up measure indicated entry into school or occupation and was not a measure of educational or occupational success.

The design of the study was not set up to investigate the combined effects of SES and IQ level on achievement. On the one hand, a similar pattern of relationship of the SES and IQ to achievement would suggest considerable overlap in the relationship of IQ and SES to achievement. On the other hand, independent effects were suggested by the moderately low correlation between IQ and SES,

.33, compared to higher correlations of these measures with achievement. Evidence to support a combined effect of SES and IQ in relationship to reading achievement was the finding that a higher percentage of underachievers came from low SES than from high SES background; whereas, in high and low IQ levels, the percentage of underachievers was the same. Further support that SES and IQ level have a combined effect on achievement level comes from Curry (1962), who compared three socio-economic status groups within each of three general ability levels. Trends from high to low on three achievement tests were found across IQ within SES level and across SES within IQ level. As in our data, the IQ score was a greater predictor of achievement than was SES level. In addition, the mean achievement scores of the nine groups were perfectly rank-ordered from high to low. The highest mean was in the high-IQ, high-SES group; the lowest was in the low-IQ, low-SES group.[29]

Considering the performance of under-, average, and over-achievers in reading across high and low IQ and SES stratifications, a consistent pattern was found in relationship to all later measures of achievement: (1) Underachievers performed below average achievers

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29 The greater separation of reading achievement groups when stratified on IQ as opposed to SES in the present study would also support Curry's conclusion that high intelligence will compensate for poor SES background more than high SES will compensate for low IQ in school achievement.

within the same level. (2) All high IQ level groups performed above all low IQ level groups, and all high SES level groups, except for underachievers, performed above all low SES level groups. (3) Differences in performance of under-, average, and overachievers were greater in high IQ and SES levels than in the low IQ and SES levels. Although there was a general decrease in the separation of groups across years, the general pattern held up consistently over replicated measures through all secondary school grades.[30] The implication of this pattern is that achievement in reading has relationship to later performance that is independent of IQ and SES. Since each predicted achievement independently, the combined information of IQ level and relative achievement in reading would increase the prediction of later performance over that obtained by either alone.

The performance of achievement groups over successive years showed an additional characteristic that was related to reading achievement and IQ level. This can be best described as a relationship of initial achievement level to gain. This relationship was found in comparisons of high and low IQ level groups on standardized tests. At one extreme, low-IQ underachievers, whose grade placement on 6th grade tests was the lowest of the six achievement groups, showed a gain in test scores to the 7th and 9th grade that was not

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[30] The longitudinal methodology, with the attrition of subjects over years, would account for some of the decrease between groups in performance level across years.

equal to the grade difference between tests. This resulted in a greater deficit relative to grade placement in subsequent years. At the other extreme, high IQ overachievers, with the highest 6th grade level, showed gain equal to or greater than that expected from the grade placement of tests.

The results indicate that in order to identify the underachiever, understand his achievement problems, and evaluate his progress in remedial programs, it is necessary to consider not only his relative reading level, but also the influence on achievement of general level of mental ability and SES background. The relationship of initial achievement level to gain also supports the philosophy of early intervention in remedying reading problems, for the evidence pointed to a combined effect of low general achievement and underachievement in reading that results in the underachievers' falling farther and farther behind his peers in each successive year.

High IQ Underachievers. Underachievers with IQ scores of 100 or above have received the most attention in previous studies. The concern has been that these students do not perform at a level commensurate with their potential. Results of this study support this concern in that high IQ underachievers were found to be performing farther below their potential than low IQ underachievers (using the performance of average achievers as a criterion of potential). On the other hand, although there was a loss in potential level of achievement, the performance of high IQ underachievers was largely within the average range.

On tested reading achievement, high IQ underachievers performed .8, .5, and .3 grades below the norm in grades 6, 7, and 9, compared to the performance of average achievers which was close to .6 grades above the norm in all three years. Underachievers performed at grade level on tests of arithmetic and language skills in the 6th grade; however, their performance fell below grade placement in grade 7.

The mean grade point average over secondary school grades was within the range of the letter grade of "C." The mean marks of average achievers ranged from C+ to B over these years. Of the high IQ average achievers, 55% took foreign language courses, a requirement in the academic curriculum. In contrast, only 40% of the high IQ underachievers took foreign language courses, and their mean performance in this area was lower than in any other. Underachievers did not receive higher grade point averages in the area of science or mathematics than average achievers, although they were not outperformed as much by average achievers in these areas.

There were two indications of adjustments that high IQ underachievers made that could reflect difficulties in keeping up with required coursework in secondary school. The first was that a higher percentage took elective art courses than did average or overachievers. The second was that a significantly higher percentage had no indication on their records of participation in school activities (clubs, sports, committees, etc.).

A significantly higher percentage of high IQ underachievers were retained in a secondary school grade than average achievers; however, this percentage was less than in any of the low IQ achievement groups. The dropout rate was higher than for average achievers, but not significantly different. Although the majority of high IQ underachievers graduated from high school (84%), a significantly lower percentage of the graduates continued training (61%) than average achievers (75%).

Low IQ Underachievers. The mean 6th grade IQ score of low IQ underachievers was 88. This low level of ability and general achievement in combination with the relatively lower level of reading skills was seen to severely handicap the performance of this group in secondary school. In the 6th and 7th grades, low IQ underachievers were reading 2.5 grades below grade placement. In the 9th grade, their reading level was 2.7 grades below placement. In all three grades,their performance was significantly below that of low IQ average achievers. What appears to be a fairly stable level of performance, low but improving proportionately, probably underestimates the severity of the reading problems in this group. The majority of low IQ underachievers dropped out of secondary school (56%), and reading level reflects only the performance of those subjects remaining in school to the 9th grade.

The performance level of low IQ underachievers was not as low in tested arithmetic and language achievement as it was in reading in the 6th grade. In these two areas, they performed 1.0 and 1.5 grades below placement. Test performance in the 7th grade, however, fell to 1.8 and 3.4 grades below placement in arithmetic and language, respectively. The mean test performance in the 9th grade was between the 20th and 30th percentiles on subtests of the ITED.

The grade point average received by low IQ underachievers was significantly below that of low IQ average achievers in all secondary school grades and varied around 2.3, a letter grade of D+ to C-. The performance of low IQ underachievers was low in all course areas. The mean performance approached a letter grade of "C" only in vocational, music, and art courses. Only 14% of this group took a foreign language course, and the mean course mark received was lower than a letter grade of "D" indicating that many failed. There was also some evidence that low IQ underachievers avoided taking courses that were not required in secondary school and more often restricted their choice of courses to one particular area.

Complete failure in coursework was reflected in the percentage of low IQ underachievers retained in secondary school grades (41%), compared to 30% for low IQ average achievers and an over-all rate of grade retention in secondary school of 17%. Of the 44% in this group who graduated from high school, less than half (41%) were pursuing additional training a year following graduation.

Since level of ability reflected in the IQ score appeared to be as much or more related to later achievement as relative level of reading achievement, the question can be raised as to whether remedial efforts to correct reading skills in elementary school would have enough effect to compensate for low level of general ability. A partial answer can be found in the performance of low IQ overachievers, whose mean 6th grade IQ score was comparable to that of the underachievers. The mean reading level of low IQ overachievers was .4 grades below placement in the 6th grade, and although there was a loss in subsequent grades relative to grade placement, the subjects were reading at the 8.5 level in the 9th grade compared to a reading level of 7.1 for underachievers. Course performance, reflected in grade point averages, was just slightly below average; only 20% were retained in a secondary school grade; and 69% successfully completed high school. Perhaps the most significant finding was that 62.5% of the low IQ overachievers who graduated continued training following graduation, as high a percentage as was found for high IQ underachievers.

Underachievers in High and Low SES Levels. The relationship of reading achievement in elementary school to secondary school performance when viewed in terms of high and low SES background was similar to that found for high and low IQ groups. The description of the performance of high IQ underachievers and low IQ underachievers relative to their peers also applies to high and low SES underachievers. There were only two findings that indicated an

association of SES level to reading achievement that was different from that of IQ level, and these differences were slight. More underachievers came from low SES background (16%) than from high SES background (13%). Conversely, 20% of the high SES group were overachievers compared to 13% of the low SES group. Within the high and low IQ ranges, the percentages of underachievers and overachievers were approximately the same (15%). Socio-economic background also had a slightly higher relationship than IQ level to whether or not high school graduates pursued additional training, particularly overachievers. Almost all high SES overachievers continued training after high school graduation (89%). This was a higher percentage than among high IQ overachievers (85%). On the other hand, fewer low SES overachievers (54%) continued training than did low IQ overachievers (63%).

Sex Differences. The percentage of underachievers among males and females was approximately the same (15%); however, the over-all performance of male underachievers was lower than that for females. Female underachievers were reading .5 grades closer to the norm than male underachievers in the 6th grade and in secondary school grades. Scores on most other achievement tests were similarly higher than those of male underachievers.

Female underachievers did considerably better than male underachievers in coursework. In fact, grade point averages of female underachievers were often higher than those of male average achievers

and, in some instances, equal to or higher than male overachievers. Comparison of the performance on standardized achievement tests with marks received for coursework strongly suggested that the school success of female underachievers resulted from differential evaluation of performance of boys and girls or from qualities other than achievement level possessed by girls and not by boys. For example, the average placement of white female underachievers on the 9th grade ITED was at the 51st percentile. White male underachievers placed at the 48th percentile, both significantly below average achievers of the same sex. The GPA for the 9th grade courses for female underachievers was 3.1 compared to a GPA of 2.6 for male underachievers. White male average achievers placed at the 64th percentile in test performance in the 9th grade, but obtained a grade point average of 2.9. White male overachievers placed at the 73rd percentile, but had a grade point average of only 3.2.

Although underachievers of both sexes performed significantly lower than average achievers of the same sex in all course areas, performance of male underachievers was closer to that of average and overachievers in vocational courses, and the performance of female underachievers was closer to that of average and overachievers in business courses.

A higher percentage of female underachievers graduated from high school (77%) than male underachievers (64%) or average achievers (71%); however, the opposite trend was found in the percentage of graduates who continued training after graduation. Sixty-five percent of the male underachievers continued training compared to 54% of the female underachievers and 66% of the female average achievers.

Race Differences. The Negro samples were more homogeneous in IQ and SES levels than the white samples. The mean IQ score in the Negro samples was 87, and the majority of Negro subjects came from the two lowest of five SES levels. If low general achievement and low SES have a combined effect upon achievement, as suggested, it would be expected that this effect would be greatest in the Negro samples. There were other differences between the white and Negro samples that could have affected the findings, and specific information on some of these factors was not known. Primary among these was the difference in the characteristics of the schools attended by the white and Negro students. The school system was segregated until 1954, when these students were in the 6th grade, and it was estimated from the school system integration report that the maximum number of Negro students in this cohort who might have attended previously all-white schools during secondary school grades was 1% (six subjects). Although specific differences in schools were not ascertained, it can be surmised from the findings of Coleman, et al. (1966) that the direction of difference was the same as that

generally found, a lower quality of education received by Negro students than by white students. The high dropout rate among Negro students (57%), which may partly reflect school differences, also affected comparison of achievement groups in later grades because of the reduced number of subjects in the groups.

In spite of differences in level and other unmeasured influences on achievement in the Negro samples, the relationship of underachievement in reading to later performance was generally the same as in the white samples. Minor differences that were found appeared to be attributable to the factors above: lower level of initial achievement (6th grade), combined negative effects of low IQ and low SES, attrition of subjects through dropout.

Reading level of Negro underachievers was 2.8 grades below placement in the 6th grade. By the 9th grade the reading level of underachievers was approximately 4.0 grades below placement. Tested level of achievement was not as low in language and arithmetic in the 6th grade (1.1 to 1.5 grade equivalents below placement); however, underachievers showed a loss relative to grade placement in the 7th and 9th grades and performed significantly below average achievers on most test measures. Where differences were not significant, the same trend was found, with underachievers performing below average and overachievers. Although loss relative to grade placement through secondary school was greatest in Negro samples (all achievement groups), this pattern also characterized the

performance of white males and white females who had IQ scores in the same range as the Negro samples.

The lack of significant differences on some measures would suggest that underachievers were not as handicapped by poor reading skills in the Negro samples, but it also has to be considered that the smaller difference across achievement groups on standardized tests occurred more from the drop in performance of average and over-achievers than from the improvement in performance of underachievers.

Underachievers had lower grade point averages than average achievers in most course areas and in grades 7 to 10, but were not significantly lower than average achievers in grades 11 and 12. In evaluating course performance, it is necessary to consider the high dropout rate of Negro underachievers (55% for Negro males and 60% for Negro females). By the 9th grade, 38% of the underachievers had dropped out of school (compared to 21% of the average achievers). By the 10th grade, 52% of the underachievers had left school (compared to 32% of the average achievers). Although the performance of the remaining underachievers was comparable to that of average achievers in grades 11 and 12, it reflected the performance of only 17 of the original 48 underachievers.

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Reading Achievement

And Its Relationship to Academic Performance

Appendix to Parts II and III

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Reading Achievement and Its Relationship to Academic Performance

Appendix to Parts II and III

The means, standard deviations, and analysis of variance data for achievement group comparisons discussed in Parts II and III of the report are presented in eight sections:

1. Combined samples - high SES
2. Combined samples - low SES
3. Combined samples - high IQ
4. Combined samples - low IQ
5. White males
6. White females
7. Negro males
8. Negro females

Data for the total combined samples was reported in the Appendix to Part I of this report.

Each of the eight sections contains comparison of the three achievement groups on the same 57 variables. The variables (J) are numbered as follows:

1	Age in 6th Grade (months)
2	Education Level of Father
3	Education Level of Mother
4	Number of Siblings
5	Occupation Level of Father
6	SES Level
7	6th Grade Point Average*
8	6th Grade CTMM IQ Score
9	Days Absent 1st Grade
10	Days Absent 2nd Grade

11 Days Absent 3rd Grade
12 Days Absent 4th Grade
13 3rd CAT - Reading Total*
14 6th CAT - Reading Vocabulary*
15 Outcome
16 6th CAT - Reading Comprehension*
17 3rd CTMM IQ Score
18 6th CAT - Reading Total*
19 6th CAT - Arithmetic Total*
20 6th CAT - Language Total*
21 English GPA*
22 Social Studies GPA*
23 Science GPA*
24 Mathematics GPA*
25 Business GPA*
26 Vocational GPA*
27 Foreign Language GPA*
28 Music GPA*
29 Art GPA*
30 Physical Education GPA*
31 GPA (Full Unit) 7th Grade*
32 GPA (Full Unit) 8th Grade*
33 GPA (Full Unit) 9th Grade*
34 GPA (Full Unit) 10th Grade*
35 GPA (Full Unit) 11th Grade*
36 GPA (Full Unit) 12th Grade*
37 Lorge-Thorndike IQ Score (7th Grade)
38 Lorge-Thorndike IQ Score (10th Grade)
39 Cornell Medical Index (11th Grade)
40 SAT Reading Average (7th Grade)*
41 SAT Spelling (7th Grade)*
42 SAT Language (7th Grade)*
43 SAT Arithmetic Average (7th Grade)*
44 SAT Average Achievement Score (7th Grade)*
45 SAT Paragraph Meaning (9th Grade)*
46 SAT Word Meaning (9th Grade)*
47 SAT Reading Average (9th Grade)*
48 ITED Social Concepts (9th Grade)
49 ITED Natural Science (General) (9th Grade)
50 ITED English Expression (9th Grade)
51 ITED Quantitative Thinking (9th Grade)
52 ITED Social Studies Reading (9th Grade)
53 ITED Natural Science Reading (9th Grade)
54 ITED Literature (9th Grade)
55 ITED Vocabulary (9th Grade)
56 ITED Use of Information (9th Grade)
57 Discrepancy Score (6th CAT - Reading Total Minus 6th CTMM Predicted Reading Total)

Variables followed by an asterisk (*) are fractional scores (GPA's and grade equivalent scores) that were treated as whole numbers in the computations. The decimal on means and standard deviations of these variables should be moved one place to the left for interpretation.

A constant of 10 was added to discrepancy scores (Variable #57) to avoid handling negative numbers in computations. The means of the race-by-sex samples (total column) therefore appear as 10 rather than 0. This score is also in grade equivalents, but treated in a whole number in computations and should have the decimal on the mean and standard deviation moved one place to the left for interpretation.

The omega^2 statistic is given as the proportion of variance accounted for across achievement groups, rather than as a percentage, as reported in the body of the report.

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-148: COMBINED SAMPLES -High SES

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 6 WITH RANGE OF 1.000 TO 3.000

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE

```
  0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,  1.000,   0.0 ,   0.0 ,
  0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,
  0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,
  0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,
  0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 ,   0.0 , 999.000,
```

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 3921 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B: COMBINED SAMPLES -High SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	193	1001	293	1487	BETWEEN GROUPS	1174.9477	2	587.4738	19.4402	0.0242
1	M	137.181	138.651	140.287	138.783	WITHIN GROUPS	44845.8916	1484	30.2196		
	SD	5.600	5.403	5.742	5.565	TOTAL	46020.8393	1486			
	N	192	992	292	1476	BETWEEN GROUPS	19.0721	2	9.5361	3.6695	0.0036
2	M	2.708	2.440	2.305	2.448	WITHIN GROUPS	3827.9109	1473	2.5987		
	SD	1.624	1.616	1.590	1.615	TOTAL	3846.9831	1475			
	N	192	995	292	1479	BETWEEN GROUPS	19.1677	2	9.5838	3.8276	0.0038
3	M	3.302	2.962	2.969	3.007	WITHIN GROUPS	3695.7505	1476	2.5039		
	SD	1.532	1.601	1.552	1.585	TOTAL	3714.9182	1478			
	N	193	1001	293	1487	BETWEEN GROUPS	1.3128	2	0.6564	0.3358	-0.0009
4	M	1.870	1.846	1.778	1.836	WITHIN GROUPS	2900.6496	1484	1.9546		
	SD	1.380	1.450	1.217	1.397	TOTAL	2901.9623	1486			
	N	188	981	289	1458	BETWEEN GROUPS	7.3267	2	3.6633	2.4620	0.0020
5	M	3.037	2.866	2.785	2.872	WITHIN GROUPS	2164.9449	1455	1.4879		
	SD	1.135	1.229	1.243	1.221	TOTAL	2172.2716	1457			
	N	193	1001	293	1487	BETWEEN GROUPS	5.8620	2	2.9310	3.9593	0.0040
6	M	2.394	2.245	2.171	2.249	WITHIN GROUPS	1098.5751	1484	0.7403		
	SD	0.804	0.865	0.879	0.862	TOTAL	1104.4371	1486			
	N	187	969	281	1437	BETWEEN GROUPS	1911.6413	2	955.8206	42.5894	0.0547
7	M	18.690	21.047	22.811	21.086	WITHIN GROUPS	32182.8306	1434	22.4427		
	SD	4.975	4.702	4.698	4.873	TOTAL	34094.4718	1436			
	N	193	1001	293	1487	BETWEEN GROUPS	1197.7817	2	598.8908	2.4645	0.0020
8	M	107.772	109.120	106.942	108.516	WITHIN GROUPS	360615.5969	1484	243.0024		
	SD	14.040	15.442	16.994	15.604	TOTAL	361813.3786	1486			
	N	97	526	135	758	BETWEEN GROUPS	8.1554	2	4.0777	2.4285	0.0038
9	M	2.969	3.057	3.304	3.090	WITHIN GROUPS	1267.7443	755	1.6791		
	SD	1.104	1.305	1.384	1.298	TOTAL	1275.8997	757			
	N	108	588	152	848	BETWEEN GROUPS	13.2102	2	6.6051	4.4206	0.0080
10	M	2.796	2.634	2.954	2.712	WITHIN GROUPS	1262.5822	845	1.4942		
	SD	1.206	1.212	1.273	1.227	TOTAL	1275.7925	847			
	N	128	685	174	987	BETWEEN GROUPS	6.1917	2	3.0959	2.0394	0.0021
11	M	2.789	2.815	3.017	2.847	WITHIN GROUPS	1493.7070	984	1.5180		
	SD	1.120	1.249	1.242	1.233	TOTAL	1499.8987	986			
	N	143	760	202	1105	BETWEEN GROUPS	7.4075	2	3.7037	2.5972	0.0029
12	M	2.371	2.314	2.530	2.361	WITHIN GROUPS	1571.5192	1102	1.4261		
	SD	1.237	1.163	1.278	1.196	TOTAL	1578.9267	1104			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B: COMBINED SAMPLES -High SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	115	645	163	931	BETWEEN GROUPS	6542.3112	2	3271.1556	47.2456	0.0904
13	M	35.429	41.214	45.178	41.169	WITHIN GROUPS	64252.2129	928	69.2373		
	SD	9.387	8.343	7.350	8.725	TOTAL	70794.5242	930			
	N	193	1000	293	1486	BETWEEN GROUPS	80788.4073	2	40394.2036	117.0072	0.1350
14	M	48.218	62.780	74.481	63.196	WITHIN GROUPS	511973.6069	1483	345.2283		
	SD	29.556	16.740	14.840	19.979	TOTAL	592762.0141	1485			
	N	146	768	206	1120	BETWEEN GROUPS	0.4622	2	0.2311	1.6829	0.0012
15	M	2.822	2.853	2.893	2.856	WITHIN GROUPS	153.3940	1117	0.1373		
	SD	0.418	0.369	0.340	0.371	TOTAL	153.8563	1119			
	N	193	1000	292	1485	BETWEEN GROUPS	58814.3038	2	29407.1519	166.6246	0.1824
16	M	54.342	65.400	76.510	66.147	WITHIN GROUPS	261554.3992	1482	176.4874		
	SD	11.309	12.918	15.542	14.693	TOTAL	320368.7030	1484			
	N	120	671	170	961	BETWEEN GROUPS	1672.7721	2	836.3861	3.6739	0.0055
17	M	109.317	112.744	114.071	112.550	WITHIN GROUPS	218093.0302	958	227.6545		
	SD	14.901	15.110	15.133	15.130	TOTAL	219765.8023	960			
	N	193	1001	293	1487	BETWEEN GROUPS	79180.0542	2	39590.0271	252.1476	0.2525
18	M	49.290	63.498	75.263	63.972	WITHIN GROUPS	233004.7596	1484	157.0113		
	SD	11.048	12.469	13.612	14.494	TOTAL	312184.8137	1486			
	N	191	991	291	1473	BETWEEN GROUPS	4583.6982	2	2291.8491	38.8538	0.0489
19	M	58.853	63.350	65.024	63.098	WITHIN GROUPS	86710.2244	1470	58.9865		
	SD	7.667	7.499	8.278	7.875	TOTAL	91293.9226	1472			
	N	192	986	289	1467	BETWEEN GROUPS	10936.7562	2	5468.3781	63.5199	0.0785
20	M	57.500	64.103	67.142	63.838	WITHIN GROUPS	126034.6317	1464	86.0892		
	SD	9.764	9.266	8.986	9.666	TOTAL	136971.3879	1466			
	N	178	934	260	1372	BETWEEN GROUPS	5288.8201	2	2644.4101	31.9852	0.0432
21	M	29.567	33.445	36.623	33.544	WITHIN GROUPS	113183.4678	1369	82.6760		
	SD	8.377	9.236	9.042	9.296	TOTAL	118472.2879	1371			
	N	178	934	260	1372	BETWEEN GROUPS	5761.2676	2	2880.6338	34.7620	0.0469
22	M	30.006	34.049	37.369	34.154	WITHIN GROUPS	113445.2827	1369	82.8673		
	SD	8.515	9.243	8.982	9.325	TOTAL	119206.5503	1371			
	N	155	828	226	1209	BETWEEN GROUPS	4083.9042	2	2041.9521	22.4208	0.0342
23	M	27.619	31.307	34.270	31.388	WITHIN GROUPS	109835.1595	1206	91.0739		
	SD	8.294	9.694	9.782	9.711	TOTAL	113919.0637	1208			
	N	178	933	260	1371	BETWEEN GROUPS	2959.2475	2	1479.6238	16.2992	0.0218
24	M	29.393	32.480	34.685	32.497	WITHIN GROUPS	124185.4935	1368	90.7789		
	SD	8.863	9.597	9.713	9.634	TOTAL	127144.7411	1370			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-148: COMBINED SAMPLES -High SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	89	51C	135	734	BETWEEN GROUPS	2C19.7165	2	1009.8583	8.0842	0.0189
25	M	28.C79	30.371	33.867	30.736	WITHIN GROUPS	91315.0083	731	124.9179		
	SD	9.818	11.203	11.893	11.284	TOTAL	93334.7248	733			
	N	176	931	258	1365	BETWEEN GROUPS	2439.5910	2	1219.7955	18.6431	0.0252
26	M	33.795	36.546	38.620	36.583	WITHIN GROUPS	89114.2214	1362	65.4289		
	SD	7.184	8.185	8.317	8.193	TOTAL	91553.8125	1364			
	N	79	536	156	771	BETWEEN GROUPS	479C.9468	2	2395.4734	16.3676	C.0383
27	M	24.304	30.C76	33.814	30.241	WITHIN GROUPS	112400.1816	768	146.3544		
	SD	10.396	12.265	12.311	12.337	TOTAL	117191.1284	770			
	N	177	923	257	1357	BETWEEN GROUPS	2389.3939	2	1194.6969	15.6820	0.C212
28	M	36.458	39.635	41.191	39.515	WITHIN GROUPS	1C3151.5465	1354	76.1828		
	SD	8.651	8.662	9.014	8.822	TOTAL	1C554C.9403	1356			
	N	108	871	233	1272	BETWEEN GROUPS	1194.6535	2	597.3267	7.4099	0.0100
29	M	34.607	36.506	38.099	36.547	WITHIN GROUPS	102296.5163	1269	80.6119		
	SD	8.855	9.09C	8.640	9.024	TOTAL	103491.1698	1271			
	N	177	928	255	1360	BETWEEN GROUPS	631.1073	2	315.5537	6.3315	0.0073
30	M	38.288	39.956	40.714	39.881	WITHIN GROUPS	67631.5956	1357	49.8391		
	SD	6.645	7.182	6.887	7.087	TOTAL	68262.7029	1359			
	N	181	935	260	1376	BETWEEN GROUPS	6867.4663	2	3433.7332	36.3117	0.0488
31	M	31.C88	35.944	39.108	35.903	WITHIN GROUPS	129834.6783	1373	94.5628		
	SD	9.733	9.862	9.206	9.971	TOTAL	1367C2.1446	1375			
	N	164	879	243	1286	BETWEEN GROUPS	6514.7355	2	3257.3678	32.1066	0.0461
32	M	3C.848	34.907	38.905	35.145	WITHIN GROUPS	13C166.3625	1283	101.4547		
	SD	9.281	1C.289	9.785	10.313	TOTAL	136681.0980	1285			
	N	155	833	227	1215	BETWEEN GROUPS	4180.CC56	2	2090.0028	23.4149	0.0356
33	M	29.710	34.001	36.427	33.907	WITHIN GROUPS	108182.4849	1212	89.2595		
	SD	8.189	9.539	9.898	9.621	TOTAL	112362.4505	1214			
	N	148	792	215	1155	BETWEEN GROUPS	3341.1384	2	1670.5692	17.3055	0.C275
34	M	27.547	30.479	33.619	30.687	WITHIN GROUPS	111207.0296	1152	96.5339		
	SD	7.398	10.C89	10.288	9.963	TOTAL	114548.1680	1154			
	N	131	688	190	1CC9	BETWEEN GROUPS	2CC7.2C91	2	1003.6045	12.6662	0.0226
35	M	28.672	31.52C	33.753	31.571	WITHIN GROUPS	79709.9743	1006	79.2346		
	SD	8.C77	9.C47	8.907	9.004	TOTAL	81717.1833	10C8			
	N	120	645	179	944	BETWEEN GROUPS	1246.2680	2	623.1340	9.72C4	0.0181
36	M	31.367	33.8C5	35.531	33.822	WITHIN GROUPS	6C323.8337	941	64.1061		
	SD	7.339	7.996	8.460	8.080	TOTAL	61570.1C17	943			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-148: COMBINED SAMPLES -High SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	179	925	252	1356	BETWEEN GROUPS	15312.2058	2	7656.1029	33.7051	0.0460
37	M	100.659	108.178	112.730	108.032	WITHIN GROUPS	307333.4307	1353	227.1496		
	SD	14.434	14.860	16.242	15.431	TOTAL	322645.6364	1355			
	N	135	704	192	1031	BETWEEN GROUPS	9752.5268	2	4876.2634	23.3823	0.0416
38	M	103.489	111.210	114.349	110.784	WITHIN GROUPS	214384.2395	1028	208.5450		
	SD	13.932	14.398	14.942	14.752	TOTAL	224136.7662	1030			
	N	78	457	138	673	BETWEEN GROUPS	3.2626	2	1.6313	1.0120	0.0000
39	M	2.923	2.777	2.928	2.825	WITHIN GROUPS	1080.0480	670	1.6120		
	SD	1.267	1.280	1.236	1.270	TOTAL	1083.3105	672			
	N	170	893	247	1310	BETWEEN GROUPS	44402.4816	2	22201.2408	54.7588	0.0758
40	M	64.618	76.772	85.611	76.861	WITHIN GROUPS	529906.2329	1307	405.4371		
	SD	17.897	20.349	20.800	20.946	TOTAL	574308.7145	1309			
	N	173	900	249	1322	BETWEEN GROUPS	24980.1115	2	12490.0558	37.0317	0.0517
41	M	60.405	69.206	76.032	69.340	WITHIN GROUPS	444872.3915	1319	337.2801		
	SD	16.773	18.215	19.899	18.859	TOTAL	469852.5030	1321			
	N	165	890	245	1300	BETWEEN GROUPS	46983.7276	2	23491.8638	40.4960	0.0573
42	M	56.976	71.056	78.722	70.741	WITHIN GROUPS	752393.9116	1297	580.1032		
	SD	21.457	24.157	25.454	24.807	TOTAL	799377.6392	1299			
	N	170	891	246	1307	BETWEEN GROUPS	6613.9897	2	3306.9949	19.3211	0.0273
43	M	65.247	71.068	73.118	70.697	WITHIN GROUPS	223192.0286	1304	171.1595		
	SD	11.289	13.169	13.894	13.265	TOTAL	229806.0184	1306			
	N	163	864	240	1267	BETWEEN GROUPS	26872.1878	2	13436.0939	52.1331	0.0747
44	M	62.644	72.359	79.279	72.420	WITHIN GROUPS	325766.4309	1264	257.7266		
	SD	13.728	16.152	17.126	16.690	TOTAL	352638.6188	1266			
	N	124	644	173	941	BETWEEN GROUPS	16445.0060	2	8222.5030	21.5989	0.0419
45	M	90.250	101.543	104.468	100.593	WITHIN GROUPS	357088.1078	938	380.6909		
	SD	21.427	19.160	19.373	19.934	TOTAL	373533.1137	940			
	N	123	644	173	940	BETWEEN GROUPS	21201.9746	2	10600.9873	34.4795	0.0665
46	M	93.553	104.910	110.561	104.464	WITHIN GROUPS	288087.7956	937	307.4576		
	SD	21.352	17.086	16.131	18.149	TOTAL	309289.7702	939			
	N	124	644	173	941	BETWEEN GROUPS	19662.6206	2	9831.3103	32.5500	0.0628
47	M	91.484	103.160	107.509	102.421	WITHIN GROUPS	283310.7311	938	302.0370		
	SD	20.291	16.933	16.759	17.953	TOTAL	302973.3518	940			
	N	141	741	193	1075	BETWEEN GROUPS	1533.2566	2	766.6283	24.4553	0.0418
48	M	11.106	14.152	15.321	13.963	WITHIN GROUPS	33605.2550	1072	31.3482		
	SD	5.187	5.647	5.703	5.720	TOTAL	35138.5116	1074			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14B: COMBINED SAMPLES -High SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	137	739	191	1067	BETWEEN GROUPS	1073.4552	2	536.7276	15.8600	0.0271
49	M	12.803	15.373	16.377	15.223	WITHIN GROUPS	36007.4576	1064	33.8416		
	SD	5.855	5.806	5.834	5.898	TOTAL	37080.9128	1066			
	N	141	746	202	1089	BETWEEN GROUPS	1454.4551	2	727.2276	28.9824	0.0489
50	M	12.567	15.019	16.752	15.023	WITHIN GROUPS	27249.9710	1086	25.0921		
	SD	4.057	4.935	5.806	5.136	TOTAL	28704.4261	1088			
	N	141	750	197	1088	BETWEEN GROUPS	605.8540	2	302.9270	7.8998	0.0125
51	M	13.277	15.207	15.909	15.084	WITHIN GROUPS	41605.5348	1085	38.3461		
	SD	5.450	6.212	6.602	6.232	TOTAL	42211.3888	1087			
	N	139	740	196	1075	BETWEEN GROUPS	1905.5269	2	952.7634	31.6483	0.0539
52	M	11.942	15.132	16.740	15.013	WITHIN GROUPS	32272.2908	1072	30.1047		
	SD	5.050	5.541	5.577	5.641	TOTAL	34177.8177	1074			
	N	139	743	195	1077	BETWEEN GROUPS	1554.6889	2	777.3445	22.0520	0.0376
53	M	11.151	13.914	15.513	13.847	WITHIN GROUPS	37859.0325	1074	35.2505		
	SD	5.261	6.026	6.048	6.052	TOTAL	39413.7214	1076			
	N	137	745	194	1076	BETWEEN GROUPS	2117.1885	2	1058.5943	33.1418	0.0564
54	M	10.190	13.459	15.304	13.375	WITHIN GROUPS	34273.1237	1073	31.9414		
	SD	5.078	5.685	5.902	5.818	TOTAL	36390.3123	1075			
	N	143	736	195	1074	BETWEEN GROUPS	1915.0208	2	957.5104	33.7943	0.0576
55	M	12.203	15.421	16.954	15.271	WITHIN GROUPS	30345.1328	1071	28.3335		
	SD	5.131	5.333	5.422	5.483	TOTAL	32260.1536	1073			
	N	141	735	193	1069	BETWEEN GROUPS	1804.6234	2	902.3117	27.3400	0.0470
56	M	12.454	15.389	17.145	15.319	WITHIN GROUPS	35181.6011	1066	33.0034		
	SD	5.545	5.708	6.022	5.885	TOTAL	36986.2245	1068			
	N	193	1001	293	1487	BETWEEN GROUPS	84683.1738	2	42341.5869	2073.5206	0.7360
57	M	87.078	100.286	113.642	101.203	WITHIN GROUPS	30303.4919	1484	20.4201		
	SD	3.978	4.504	4.890	8.797	TOTAL	114986.6658	1486			

LLCYC 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYC 1-14C: COMBINED SAMPLES-Low SES

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 6 WITH RANGE OF 4.000 TO 5.000

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE 0.0 , 0.0 , 0.0 , -9.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 1.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 3921 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLCYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLCYD 1-14C: COMBINED SAMPLES -Low SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	315	1401	255	1971	BETWEEN GROUPS	2353.3268	2	1176.6634	20.2273	0.0191
1	M	139.686	140.911	143.663	141.071	WITHIN GROUPS	114482.7290	1968	58.1721		
	SD	7.058	7.492	8.933	7.701	TOTAL	116836.0558	1970			
	N	310	1378	250	1938	BETWEEN GROUPS	2.6677	2	1.3339	1.2699	0.0003
2	M	4.919	4.821	4.808	4.835	WITHIN GROUPS	2032.4943	1935	1.0504		
	SD	1.022	1.022	1.043	1.025	TOTAL	2035.1620	1937			
	N	312	1375	251	1938	BETWEEN GROUPS	0.8198	2	0.4099	0.2663	-0.0008
3	M	4.394	4.435	4.470	4.433	WITHIN GROUPS	2978.9599	1935	1.5395		
	SD	1.284	1.256	1.096	1.240	TOTAL	2979.7797	1937			
	N	315	1401	255	1971	BETWEEN GROUPS	5.3873	2	2.6936	0.5254	-0.0005
4	M	2.727	2.822	2.686	2.789	WITHIN GROUPS	10088.8116	1968	5.1264		
	SD	2.075	2.310	2.232	2.264	TOTAL	10094.1989	1970			
	N	308	1377	253	1938	BETWEEN GROUPS	0.1817	2	0.0909	0.1587	-0.0009
5	M	5.429	5.439	5.411	5.434	WITHIN GROUPS	1107.8642	1935	0.5725		
	SD	0.721	0.750	0.834	0.756	TOTAL	1108.0459	1937			
	N	315	1401	255	1971	BETWEEN GROUPS	0.0285	2	0.0143	0.0804	-0.0009
6	M	4.238	4.228	4.231	4.230	WITHIN GROUPS	348.8573	1968	0.1773		
	SD	0.427	0.419	0.423	0.421	TOTAL	348.8858	1970			
	N	308	1355	249	1912	BETWEEN GROUPS	2470.0025	2	1235.0013	50.9632	0.0497
7	M	16.688	18.908	20.884	18.808	WITHIN GROUPS	46261.1690	1909	24.2332		
	SD	4.966	4.853	5.239	5.050	TOTAL	48731.1715	1911			
	N	315	1401	255	1971	BETWEEN GROUPS	3609.5204	2	1804.7602	6.7601	0.0058
8	M	100.517	97.769	95.533	97.919	WITHIN GROUPS	525402.6531	1968	266.9729		
	SD	15.682	16.011	18.751	16.387	TOTAL	529012.1735	1970			
	N	182	842	152	1176	BETWEEN GROUPS	4.5095	2	2.2547	1.0358	0.0001
9	M	2.841	2.930	3.072	2.935	WITHIN GROUPS	2553.4489	1173	2.1769		
	SD	1.415	1.487	1.483	1.475	TOTAL	2557.9583	1175			
	N	201	931	167	1299	BETWEEN GROUPS	4.1572	2	2.0786	1.0811	0.0001
10	M	2.552	2.684	2.754	2.673	WITHIN GROUPS	2491.7935	1296	1.9227		
	SD	1.272	1.406	1.412	1.387	TOTAL	2495.9507	1298			
	N	228	1032	188	1448	BETWEEN GROUPS	1.5578	2	0.7789	0.4739	-0.0007
11	M	2.798	2.708	2.707	2.722	WITHIN GROUPS	2374.8372	1445	1.6435		
	SD	1.203	1.281	1.378	1.282	TOTAL	2376.3950	1447			
	N	251	1126	199	1576	BETWEEN GROUPS	0.7199	2	0.3599	0.2165	-0.0010
12	M	2.462	2.404	2.402	2.413	WITHIN GROUPS	2615.3708	1573	1.6627		
	SD	1.321	1.274	1.333	1.289	TOTAL	2616.0907	1575			

LLCYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLCYD 1-14C: COMBINED SAMPLES -Low SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	206	908	153	1267	BETWEEN GROUPS	4526.8005	2	2263.4003	28.8612	0.0421
13	M	33.097	36.872	40.157	36.655	WITHIN GROUPS	99127.4742	1264	78.4236		
	SD	9.133	8.813	8.731	9.049	TOTAL	103654.2747	1266			
	N	310	1354	251	1915	BETWEEN GROUPS	83941.4419	2	41970.7209	111.2833	0.1033
14	M	40.645	53.285	65.076	52.784	WITHIN GROUPS	721114.4881	1912	377.1519		
	SD	12.962	21.096	16.376	20.509	TOTAL	805055.9300	1914			
	N	267	1179	205	1651	BETWEEN GROUPS	1.1921	2	0.5960	2.5345	0.0019
15	M	2.625	2.671	2.727	2.671	WITHIN GROUPS	387.5614	1648	0.2352		
	SD	0.493	0.486	0.468	0.485	TOTAL	388.7535	1650			
	N	310	1351	251	1912	BETWEEN GROUPS	47177.0274	2	23588.5137	136.8271	0.1244
16	M	49.935	57.492	68.343	57.691	WITHIN GROUPS	329104.9119	1909	172.3965		
	SD	16.534	11.727	15.357	14.032	TOTAL	376281.9393	1911			
	N	203	975	174	1352	BETWEEN GROUPS	1975.6439	2	987.8220	3.6921	0.0040
17	M	101.502	102.790	105.914	102.999	WITHIN GROUPS	360926.3531	1349	267.5510		
	SD	16.549	16.111	17.470	16.390	TOTAL	362901.9970	1351			
	N	315	1401	255	1971	BETWEEN GROUPS	74014.6639	2	37007.3320	234.5400	0.1916
18	M	43.432	54.338	66.322	54.146	WITHIN GROUPS	310524.5456	1968	157.7869		
	SD	11.601	12.418	14.361	13.971	TOTAL	384539.2095	1970			
	N	312	1385	252	1949	BETWEEN GROUPS	4608.3739	2	2304.1870	32.2648	0.0311
19	M	55.910	58.545	61.659	58.526	WITHIN GROUPS	138973.5676	1946	71.4150		
	SD	8.736	8.399	8.377	8.585	TOTAL	143581.9415	1948			
	N	309	1376	252	1937	BETWEEN GROUPS	9867.3761	2	4933.6880	46.9486	0.0453
20	M	53.909	58.384	62.250	58.173	WITHIN GROUPS	203238.3400	1934	105.0870		
	SD	10.350	10.221	10.294	10.492	TOTAL	213105.7161	1936			
	N	302	1314	236	1852	BETWEEN GROUPS	3202.3258	2	1601.1629	22.2286	0.0224
21	M	25.275	27.995	30.081	27.817	WITHIN GROUPS	133186.6218	1849	72.0317		
	SD	7.665	8.578	8.964	8.584	TOTAL	136388.9476	1851			
	N	302	1315	236	1853	BETWEEN GROUPS	3192.4369	2	1596.2185	21.4392	0.0216
22	M	25.715	28.047	30.614	27.994	WITHIN GROUPS	137738.4978	1850	74.4532		
	SD	7.948	8.654	9.299	8.723	TOTAL	140930.9347	1852			
	N	266	1182	211	1659	BETWEEN GROUPS	1322.8883	2	661.4442	8.0948	0.0089
23	M	25.109	26.863	28.427	26.781	WITHIN GROUPS	135315.2467	1656	81.7121		
	SD	8.290	9.099	9.595	9.078	TOTAL	136638.1350	1658			
	N	302	1315	236	1853	BETWEEN GROUPS	2865.7090	2	1432.8545	18.5376	0.0186
24	M	24.752	27.389	29.267	27.199	WITHIN GROUPS	142995.2073	1850	77.2947		
	SD	8.214	8.796	9.458	8.875	TOTAL	145860.9164	1852			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C: COMBINED SAMPLES -Low SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	161	731	124	1016	BETWEEN GROUPS	1C4.6579	2	52.3289	0.5356	-C.0009
25	M	26.COC	26.891	26.742	26.731	WITHIN GROUPS	98966.9868	1013	97.6969		
	SD	9.138	10.COO	10.126	9.880	TOTAL	99071.6447	1015			
	N	301	1304	235	1840	BETWEEN GROUPS	953.9672	2	476.9836	7.1714	0.0067
26	M	30.973	32.368	33.634	32.302	WITHIN GROUPS	122181.6279	1837	66.5115		
	SC	7.711	8.221	8.340	8.183	TOTAL	123135.5951	1839			
	N	64	359	82	505	BETWEEN GROUPS	627.4734	2	313.7367	2.1818	0.0047
27	M	23.016	25.903	27.061	25.725	WITHIN GROUPS	72187.2672	502	143.7993		
	SD	12.365	12.CC3	11.639	12.020	TOTAL	72814.7406	504			
	N	298	1294	231	1823	BETWEEN GROUPS	1524.4893	2	762.2446	8.7983	0.0085
28	M	32.510	34.692	35.641	34.455	WITHIN GROUPS	157675.6171	1820	86.6350		
	SD	9.473	9.272	9.293	9.348	TOTAL	159200.1064	1822			
	N	287	1223	224	1734	BETWEEN GROUPS	5C7.9320	2	253.9660	3.2966	0.0026
29	M	31.338	32.703	33.063	32.524	WITHIN GROUPS	133354.5986	1731	77.0391		
	SD	8.777	8.747	8.938	8.789	TOTAL	133862.53C6	1733			
	N	299	1304	235	1838	BETWEEN GROUPS	434.8228	2	217.4114	3.0823	0.0023
30	M	35.094	35.70C	36.885	35.753	WITHIN GROUPS	129433.0358	1835	70.5357		
	SD	8.187	8.446	8.397	8.408	TOTAL	129867.8585	1837			
	N	301	1315	237	1853	BETWEEN GROUPS	5574.6503	2	2787.3251	30.357C	0.0307
31	M	26.814	3C.281	33.203	30.092	WITHIN GROUPS	169863.7534	1850	91.8182		
	SD	9.015	9.628	10.C14	9.733	TOTAL	175438.4037	1852			
	N	288	1242	225	1755	BETWEEN GROUPS	3546.3506	2	1773.1753	18.5404	0.0196
32	M	26.458	29.404	31.631	29.206	WITHIN GROUPS	167558.9805	1752	95.6387		
	SD	9.177	9.719	10.806	9.877	TOTAL	171105.3311	1754			
	N	259	1178	210	1647	BETWEEN GROUPS	1150.6011	2	575.3006	7.1451	0.0074
33	M	27.336	28.846	30.481	28.817	WITHIN GROUPS	132369.3892	1644	80.5167		
	SD	8.050	9.084	9.416	9.007	TOTAL	133519.9903	1646			
	N	237	1063	194	1494	BETWEEN GROUPS	1078.2850	2	539.1425	6.7507	0.0076
34	M	25.401	27.024	28.562	26.967	WITHIN GROUPS	119C78.0416	1491	79.8645		
	SD	8.378	8.929	9.613	8.971	TOTAL	120156.3266	1493			
	N	191	892	162	1245	BETWEEN GROUPS	504.[illegible]	2	252.4031	3.6428	0.0042
35	M	26.508	27.777	28.889	27.727	WITHIN GROUPS	86C56.3425	1242	69.2885		
	SD	7.428	8.40C	8.884	8.342	TOTAL	865[illegible]1.1486	1244			
	N	163	777	146	1086	BETWEEN GROUPS	587.0183	2	293.5091	4.9869	0.0073
36	M	8.601	3C.183	31.315	30.098	WITHIN GROUPS	63740.6355	1C83	58.8556		
	SD	7.487	7.727	7.577	7.70C	TOTAL	64327.6538	1085			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C: COMBINED SAMPLES -Low SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	291	1280	233	1804	BETWEEN GROUPS	12195.7492	2	6097.8746	28.2102	0.0299
37	M	92.464	96.717	102.172	96.736	WITHIN GROUPS	389301.1261	1801	216.1583		
	SD	13.672	14.686	15.979	14.923	TOTAL	401496.8753	1803			
	N	211	958	170	1339	BETWEEN GROUPS	3549.0348	2	1774.5174	9.3180	0.0123
38	M	98.645	100.684	104.682	100.870	WITHIN GROUPS	254428.3543	1336	190.4404		
	SD	13.366	13.636	15.183	13.886	TOTAL	257977.3891	1338			
	N	130	643	114	887	BETWEEN GROUPS	3.2446	2	1.6223	0.8860	-0.0003
39	M	3.285	3.114	3.114	3.139	WITHIN GROUPS	1618.6991	884	1.8311		
	SD	1.307	1.361	1.362	1.353	TOTAL	1621.9436	886			
	N	272	1237	225	1734	BETWEEN GROUPS	33392.7591	2	16696.3796	47.9649	0.0514
40	M	56.250	61.973	72.484	62.439	WITHIN GROUPS	602554.2610	1731	348.0960		
	SD	16.595	18.494	21.664	19.156	TOTAL	635947.0202	1733			
	N	286	1244	229	1759	BETWEEN GROUPS	21040.9114	2	10520.4557	38.0776	0.0403
41	M	53.364	60.038	66.114	59.744	WITHIN GROUPS	485164.4541	1756	276.2896		
	SD	14.917	16.849	17.379	16.969	TOTAL	506205.3655	1758			
	N	261	1175	224	1660	BETWEEN GROUPS	27901.3981	2	13950.6991	28.2042	0.0317
42	M	49.375	56.427	64.589	56.420	WITHIN GROUPS	819604.9459	1657	494.6318		
	SD	20.711	22.135	24.409	22.602	TOTAL	847506.3440	1659			
	N	278	1224	221	1723	BETWEEN GROUPS	4692.9338	2	2346.4669	15.3615	0.0164
43	M	59.867	62.598	66.041	62.599	WITHIN GROUPS	262728.9443	1720	152.7494		
	SD	11.494	12.329	13.521	12.462	TOTAL	267421.8781	1722			
	N	260	1179	219	1658	BETWEEN GROUPS	14518.8435	2	7259.4217	32.8498	0.0370
44	M	56.292	60.997	67.329	61.095	WITHIN GROUPS	365736.0998	1655	220.9886		
	SD	13.628	14.771	16.674	15.149	TOTAL	380254.9433	1657			
	N	179	777	142	1098	BETWEEN GROUPS	9421.3649	2	4710.6825	9.1484	0.0146
45	M	84.480	87.972	95.183	88.335	WITHIN GROUPS	563837.2981	1095	514.9199		
	SD	22.529	22.604	23.368	22.860	TOTAL	573258.6630	1097			
	N	178	776	142	1096	BETWEEN GROUPS	15126.9992	2	7563.4996	16.2153	0.0270
46	M	85.298	91.276	99.134	91.323	WITHIN GROUPS	509822.6614	1093	466.4434		
	SD	21.673	21.690	20.984	21.895	TOTAL	524949.6606	1095			
	N	178	777	142	1097	BETWEEN GROUPS	12008.6021	2	6004.3010	13.6775	0.0236
47	M	84.916	89.542	97.169	89.778	WITHIN GROUPS	480254.5702	1094	438.9896		
	SD	20.875	20.930	21.169	21.193	TOTAL	492263.1723	1096			
	N	226	1046	189	1461	BETWEEN GROUPS	790.1775	2	395.0887	16.3185	0.0209
48	M	9.810	10.754	12.534	10.838	WITHIN GROUPS	35299.7007	1458	24.2110		
	SD	4.899	4.855	5.293	4.972	TOTAL	36089.8782	1460			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14C: COMBINED SAMPLES -Low SES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	226	1040	188	1454	BETWEEN GROUPS	890.4306	2	445.2153	13.4467	0.0168
49	M	10.230	11.583	13.176	11.578	WITHIN GROUPS	48042.1313	1451	33.1097		
	SD	5.705	5.711	6.046	5.803	TOTAL	48932.5619	1453			
	N	226	1042	191	1459	BETWEEN GROUPS	365.3287	2	182.6644	7.7604	0.0092
50	M	11.045	11.937	12.927	11.929	WITHIN GROUPS	34271.2580	1456	23.5380		
	SD	4.831	4.828	5.003	4.874	TOTAL	34636.5867	1458			
	N	229	1035	191	1455	BETWEEN GROUPS	327.0759	2	163.5380	5.0715	0.0056
51	M	11.044	11.496	12.733	11.587	WITHIN GROUPS	46821.6760	1453	32.2463		
	SD	5.537	5.608	6.202	5.694	TOTAL	47148.7519	1454			
	N	229	1042	188	1459	BETWEEN GROUPS	878.8895	2	439.4448	18.0602	0.0229
52	M	10.672	11.773	13.569	11.831	WITHIN GROUPS	35427.6328	1456	24.3322		
	SD	4.796	4.805	5.735	4.990	TOTAL	36306.5223	1458			
	N	229	1051	188	1468	BETWEEN GROUPS	872.4598	2	436.2299	14.6756	0.0183
53	M	9.559	10.665	12.447	10.721	WITHIN GROUPS	43547.0307	1465	29.7249		
	SD	5.344	5.340	6.157	5.503	TOTAL	44419.4905	1467			
	N	231	1041	187	1459	BETWEEN GROUPS	888.6371	2	444.3185	15.4156	0.0194
54	M	8.827	10.311	11.743	10.260	WITHIN GROUPS	41965.9112	1456	28.8227		
	SD	5.286	5.282	5.923	5.422	TOTAL	42854.5483	1458			
	N	231	1041	193	1465	BETWEEN GROUPS	1038.3445	2	519.1722	19.1357	0.0242
55	M	10.351	11.584	13.477	11.639	WITHIN GROUPS	39665.6378	1462	27.1311		
	SD	5.139	5.133	5.675	5.273	TOTAL	40703.9823	1464			
	N	228	1026	188	1442	BETWEEN GROUPS	607.9809	2	303.9904	10.5967	0.0131
56	M	10.570	11.534	12.989	11.571	WITHIN GROUPS	41281.1620	1439	28.6874		
	SD	5.242	5.258	5.990	5.392	TOTAL	41889.1429	1441			
	N	315	1401	255	1971	BETWEEN GROUPS	101136.4990	2	50568.2495	2453.2813	0.7133
57	M	86.695	99.542	113.443	99.288	WITHIN GROUPS	40565.3914	1968	20.6125		
	SD	4.715	4.459	4.757	8.481	TOTAL	141701.8904	1970			

LLCYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYC 1-14E: COMBINED SAMPLES-High IQ

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 8 WITH RANGE OF 100.000 TO 175.000

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE 0.0 , 0.0 , 0.0 , -9.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 1.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 3921 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLCYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLCYD 1-14E: COMBINED SAMPLES -High IQ

J		1	2	3	TOTAL	SCURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	319	1495	343	2157	BETWEEN GROUPS	1071.4690	2	535.7345	27.7581	0.0242
1	M	136.678	138.056	139.414	138.099	WITHIN GROUPS	41572.4976	2154	19.3001		
	SD	4.645	4.373	4.237	4.447	TOTAL	42643.9666	2156			
	N	307	1432	326	2065	BETWEEN GROUPS	79.7334	2	39.8667	12.6302	0.0111
2	M	3.756	3.375	3.046	3.380	WITHIN GROUPS	6508.6123	2062	3.1565		
	SD	1.740	1.769	1.845	1.787	TOTAL	6588.3458	2064			
	N	306	1441	327	2074	BETWEEN GROUPS	17.3786	2	8.6893	3.5746	0.0025
3	M	3.663	3.474	3.333	3.480	WITHIN GROUPS	5034.2708	2071	2.4308		
	SD	1.453	1.577	1.573	1.561	TOTAL	5051.6495	2073			
	N	319	1495	343	2157	BETWEEN GROUPS	3.0718	2	1.5359	0.5974	-0.0004
4	M	1.918	1.920	1.816	1.903	WITHIN GROUPS	5537.6773	2154	2.5709		
	SD	1.529	1.648	1.466	1.603	TOTAL	5540.7492	2156			
	N	300	1417	324	2041	BETWEEN GROUPS	61.4610	2	30.7305	11.4298	0.0101
5	M	4.230	4.004	3.620	3.976	WITHIN GROUPS	5479.4101	2038	2.6886		
	SD	1.518	1.650	1.701	1.648	TOTAL	5540.8711	2040			
	N	305	1428	324	2057	BETWEEN GROUPS	45.2116	2	22.6058	15.4711	0.0139
6	M	3.328	3.097	2.796	3.084	WITHIN GROUPS	3001.2386	2054	1.4612		
	SD	1.134	1.211	1.265	1.217	TOTAL	3046.4502	2056			
	N	301	1410	317	2028	BETWEEN GROUPS	3021.2850	2	1510.6425	88.0618	0.0791
7	M	19.784	21.851	24.196	21.911	WITHIN GROUPS	34737.5607	2025	17.1544		
	SD	4.247	4.102	4.217	4.316	TOTAL	37758.8457	2027			
	N	319	1495	343	2157	BETWEEN GROUPS	468.6077	2	234.3038	2.5002	0.0014
8	M	113.611	113.533	114.819	113.749	WITHIN GROUPS	201860.7034	2154	93.7143		
	SD	9.108	9.758	9.854	9.687	TOTAL	202329.3111	2156			
	N	165	793	180	1138	BETWEEN GROUPS	10.5023	2	5.2511	3.0404	0.0036
9	M	2.873	2.997	3.211	3.013	WITHIN GROUPS	1960.3000	1135	1.7271		
	SD	1.149	1.346	1.316	1.317	TOTAL	1970.8023	1137			
	N	184	897	201	1282	BETWEEN GROUPS	2.0862	2	1.0431	0.6120	-0.0006
10	M	2.663	2.695	2.796	2.706	WITHIN GROUPS	2180.0487	1279	1.7045		
	SD	1.153	1.326	1.347	1.305	TOTAL	2182.1349	1281			
	N	208	1020	226	1454	BETWEEN GROUPS	2.2953	2	1.1477	0.7618	-0.0003
11	M	2.731	2.782	2.872	2.789	WITHIN GROUPS	2185.8842	1451	1.5065		
	SD	1.038	1.244	1.309	1.227	TOTAL	2188.1795	1453			
	N	232	1130	249	1611	BETWEEN GROUPS	0.4208	2	0.2104	0.1528	-0.0011
12	M	2.358	2.317	2.345	2.327	WITHIN GROUPS	2214.1838	1608	1.3770		
	SD	1.268	1.151	1.185	1.173	TOTAL	2214.6046	1610			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E: COMBINED SAMPLES -High IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	190	961	201	1352	BETWEEN GROUPS	7520.0367	2	3760.0183	74.2915	0.0978
13	M	37.984	42.814	46.741	42.719	WITHIN GROUPS	68275.1586	1349	50.6117		
	SD	8.295	7.134	5.660	7.490	TOTAL	75795.1953	1351			
	N	318	1487	342	2147	BETWEEN GROUPS	146342.9033	2	73171.4516	287.4728	0.2106
14	M	50.465	66.410	80.254	66.254	WITHIN GROUPS	545719.7525	2144	254.5335		
	SD	10.889	17.776	10.634	17.958	TOTAL	692062.6558	2146			
	N	253	1155	245	1653	BETWEEN GROUPS	0.3899	2	0.1950	1.4551	0.0006
15	M	2.838	2.867	2.894	2.866	WITHIN GROUPS	221.0632	1650	0.1340		
	SD	0.400	0.365	0.334	0.366	TOTAL	221.4531	1652			
	N	318	1487	341	2146	BETWEEN GROUPS	102838.6465	2	51419.3232	384.1630	0.2631
16	M	57.965	67.541	82.431	69.498	WITHIN GROUPS	286835.5385	2143	133.8477		
	SD	14.927	10.576	12.126	13.478	TOTAL	389674.1850	2145			
	N	195	1000	224	1419	BETWEEN GROUPS	4396.4406	2	2198.2203	12.0700	0.0154
17	M	110.774	113.720	117.214	113.867	WITHIN GROUPS	257885.3861	1416	182.1224		
	SD	13.668	13.564	13.027	13.600	TOTAL	262281.8266	1418			
	N	319	1495	343	2157	BETWEEN GROUPS	130561.8552	2	65280.9276	839.4946	0.4374
18	M	52.828	66.299	80.878	66.625	WITHIN GROUPS	167499.7229	2154	77.7622		
	SD	8.463	8.832	9.077	11.758	TOTAL	298061.5781	2156			
	N	315	1482	340	2137	BETWEEN GROUPS	6616.1053	2	3308.0527	83.9457	0.0720
19	M	61.279	64.679	67.638	64.649	WITHIN GROUPS	84094.6752	2134	39.4071		
	SD	6.272	6.175	6.710	6.517	TOTAL	90710.7805	2136			
	N	312	1474	338	2124	BETWEEN GROUPS	14165.2760	2	7082.6380	129.2772	0.1078
20	M	60.955	66.016	70.293	65.953	WITHIN GROUPS	116202.0159	2121	54.7864		
	SD	7.576	7.431	7.106	7.836	TOTAL	130367.2919	2123			
	N	295	1364	300	1959	BETWEEN GROUPS	8752.9068	2	4376.4534	62.4047	0.0590
21	M	29.969	34.164	37.620	34.062	WITHIN GROUPS	137174.6195	1956	70.1302		
	SD	7.949	8.448	8.446	8.633	TOTAL	145927.5263	1958			
	N	295	1365	300	1960	BETWEEN GROUPS	9763.2041	2	4881.6021	68.6150	0.0645
22	M	30.369	34.541	38.470	34.515	WITHIN GROUPS	139230.3668	1957	71.1448		
	SD	8.123	8.509	8.394	8.721	TOTAL	148993.5709	1959			
	N	270	1245	266	1781	BETWEEN GROUPS	6918.4707	2	3459.2354	42.7480	0.0448
23	M	28.263	31.908	35.447	31.884	WITHIN GROUPS	143878.4703	1778	80.9215		
	SD	8.125	9.203	8.853	9.204	TOTAL	150796.9410	1780			
	N	295	1364	300	1959	BETWEEN GROUPS	6817.7021	2	3408.8510	43.7817	0.0418
24	M	29.641	33.279	36.400	33.209	WITHIN GROUPS	152294.4888	1956	77.8602		
	SD	8.447	8.893	8.871	9.015	TOTAL	159112.1909	1958			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E: COMBINED SAMPLES -High IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	176	827	157	1160	BETWEEN GROUPS	3193.0635	2	1596.5318	14.6160	0.0229
25	M	28.398	31.060	34.586	31.134	WITHIN GROUPS	126381.2253	1157	109.2318		
	SD	9.440	10.575	10.865	10.573	TOTAL	129574.2888	1159			
	N	294	1355	299	1948	BETWEEN GROUPS	3791.0647	2	1895.5324	30.5873	0.0295
26	M	34.041	36.811	39.084	36.742	WITHIN GROUPS	120534.0539	1945	61.9712		
	SD	7.443	7.918	8.070	7.991	TOTAL	124325.1186	1947			
	N	117	752	185	1054	BETWEEN GROUPS	5853.7209	2	2926.8605	20.2049	0.0352
27	M	25.171	29.547	34.124	30.150	WITHIN GROUPS	152246.5941	1051	144.8588		
	SD	11.256	12.173	11.946	12.253	TOTAL	158100.3150	1053			
	N	294	1346	297	1937	BETWEEN GROUPS	3270.9756	2	1635.4878	23.6540	0.0229
28	M	36.864	39.950	41.364	39.699	WITHIN GROUPS	133720.9500	1934	69.1422		
	SD	8.491	8.218	8.573	8.412	TOTAL	136991.9257	1936			
	N	283	1249	271	1803	BETWEEN GROUPS	1887.3635	2	943.6818	12.5417	0.0126
29	M	34.618	36.882	38.214	36.727	WITHIN GROUPS	135438.8339	1800	75.2438		
	SD	8.721	8.601	8.957	8.730	TOTAL	137326.1974	1802			
	N	292	1356	299	1947	BETWEEN GROUPS	1413.7661	2	706.8831	14.7537	0.0139
30	M	38.017	39.562	41.030	39.834	WITHIN GROUPS	93141.6494	1944	47.9124		
	SD	6.826	6.983	6.735	6.971	TOTAL	94555.4155	1946			
	N	298	1360	302	1960	BETWEEN GROUPS	12239.8233	2	6119.9116	76.0881	0.0712
31	M	31.836	36.981	40.808	36.788	WITHIN GROUPS	157405.3068	1957	80.4319		
	SD	9.300	9.029	8.336	9.306	TOTAL	169645.1301	1959			
	N	282	1284	287	1853	BETWEEN GROUPS	10873.7513	2	5436.8757	61.3185	0.0611
32	M	31.227	35.815	39.965	35.760	WITHIN GROUPS	164032.3814	1850	88.6662		
	SD	9.058	9.530	9.248	9.718	TOTAL	174906.1328	1852			
	N	269	1249	270	1788	BETWEEN GROUPS	7020.5377	2	3510.2689	44.5619	0.0465
33	M	30.379	34.473	37.548	34.322	WITHIN GROUPS	140609.5490	1785	78.7729		
	SD	7.934	9.030	9.036	9.089	TOTAL	147630.0867	1787			
	N	261	1196	254	1711	BETWEEN GROUPS	6164.2196	2	3082.1098	36.0102	0.0393
34	M	28.314	31.211	35.185	31.359	WITHIN GROUPS	146187.4437	1708	85.5898		
	SD	7.866	9.531	9.230	9.439	TOTAL	152351.6634	1710			
	N	228	1062	233	1523	BETWEEN GROUPS	2973.3877	2	1486.6938	19.7186	0.0240
35	M	29.004	31.725	34.077	31.678	WITHIN GROUPS	114601.3188	1520	75.3956		
	SD	7.585	8.812	9.086	8.789	TOTAL	117574.7065	1522			
	N	207	983	216	1406	BETWEEN GROUPS	2360.7540	2	1180.3770	19.2214	0.0253
36	M	31.290	33.781	36.014	33.757	WITHIN GROUPS	86157.5426	1403	61.4095		
	SD	7.312	7.905	8.005	7.937	TOTAL	88518.2966	1405			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E: COMBINED SAMPLES -High IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	291	1331	294	1916	BETWEEN GROUPS	30579.2089	2	15289.6045	105.2216	0.0981
37	M	102.990	110.165	117.449	110.193	WITHIN GROUPS	277975.3401	1913	145.3086		
	SD	11.899	12.083	12.079	12.694	TOTAL	308554.5491	1915			
	N	239	1075	228	1542	BETWEEN GROUPS	17632.7933	2	8816.3967	60.9654	0.0722
38	M	105.469	112.087	117.715	111.894	WITHIN GROUPS	222559.7644	1539	144.6132		
	SD	12.213	11.963	12.124	12.485	TOTAL	240192.5577	1541			
	N	151	724	160	1035	BETWEEN GROUPS	5.4946	2	2.7473	1.5775	0.0011
39	M	3.073	2.863	2.906	2.900	WITHIN GROUPS	1797.2551	1032	1.7415		
	SD	1.302	1.334	1.268	1.320	TOTAL	1802.7498	1034			
	N	282	1306	289	1877	BETWEEN GROUPS	89453.7679	2	44726.8839	149.2665	0.1364
40	M	66.631	78.607	91.640	78.815	WITHIN GROUPS	561533.7121	1874	299.6445		
	SD	16.251	17.612	16.930	18.628	TOTAL	650987.4800	1876			
	N	290	1314	292	1896	BETWEEN GROUPS	43957.6159	2	21978.8079	84.1246	0.0806
41	M	62.717	71.782	80.089	71.675	WITHIN GROUPS	494574.2491	1893	261.2648		
	SD	14.900	16.343	16.551	16.858	TOTAL	538531.8650	1895			
	N	279	1303	291	1873	BETWEEN GROUPS	87180.4500	2	43590.2250	97.4841	0.0934
42	M	59.932	73.380	84.632	73.125	WITHIN GROUPS	836174.3156	1870	447.1520		
	SD	19.894	21.342	21.422	22.209	TOTAL	923354.7656	1872			
	N	280	1307	286	1873	BETWEEN GROUPS	14300.2796	2	7150.1398	55.5389	0.0550
43	M	66.704	72.343	76.710	72.167	WITHIN GROUPS	240745.7482	1870	128.7410		
	SD	10.299	11.516	11.541	11.672	TOTAL	255046.0278	1872			
	N	272	1263	281	1816	BETWEEN GROUPS	47004.4740	2	23502.2370	132.4718	0.1265
44	M	69.029	74.279	83.470	74.316	WITHIN GROUPS	321650.0965	1813	177.4132		
	SD	12.052	13.514	13.604	14.252	TOTAL	368654.5705	1815			
	N	211	966	201	1378	BETWEEN GROUPS	31897.0246	2	15948.5123	56.7059	0.0748
45	M	93.588	102.988	111.134	102.737	WITHIN GROUPS	386718.3520	1375	281.2497		
	SD	19.562	16.946	12.095	17.436	TOTAL	418615.3766	1377			
	N	210	966	201	1377	BETWEEN GROUPS	37715.1468	2	18857.5734	87.4279	0.1115
46	M	96.205	106.483	115.303	106.203	WITHIN GROUPS	296361.9178	1374	215.6928		
	SD	17.838	14.838	9.324	15.582	TOTAL	334077.0646	1376			
	N	211	966	201	1378	BETWEEN GROUPS	35710.1246	2	17855.0623	86.4085	0.1103
47	M	94.664	104.710	113.214	104.412	WITHIN GROUPS	284123.7506	1375	206.6355		
	SD	17.328	14.519	9.397	15.240	TOTAL	319833.8752	1377			
	N	242	1131	232	1605	BETWEEN GROUPS	2668.5460	2	1334.2730	50.0137	0.0576
48	M	11.682	14.078	16.427	14.056	WITHIN GROUPS	42738.4073	1602	26.6782		
	SD	5.037	5.195	5.150	5.321	TOTAL	45406.9533	1604			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14E: COMBINED SAMPLES-High IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	241	1125	226	1592	BETWEEN GROUPS	2782.5249	2	1391.2624	44.3662	0.0517
49	M	12.602	15.332	17.442	15.218	WITHIN GROUPS	49828.8413	1589	31.3586		
	SD	5.963	5.595	5.210	5.750	TOTAL	52611.3662	1591			
	N	243	1133	239	1615	BETWEEN GROUPS	2447.8644	2	1223.9322	60.0409	0.0681
50	M	13.202	15.295	17.703	15.336	WITHIN GROUPS	32860.5666	1612	20.3850		
	SD	4.089	4.526	4.862	4.677	TOTAL	35308.4310	1614			
	N	246	1133	237	1616	BETWEEN GROUPS	1566.2158	2	783.1079	23.7138	0.0273
51	M	13.622	15.356	17.224	15.366	WITHIN GROUPS	53266.6449	1613	33.0233		
	SD	5.498	5.761	5.927	5.827	TOTAL	54832.8608	1615			
	N	245	1131	236	1612	BETWEEN GROUPS	3413.1211	2	1706.5605	69.8773	0.0787
52	M	12.547	15.319	17.869	15.271	WITHIN GROUPS	39295.4118	1609	24.4223		
	SD	4.823	4.983	4.867	5.149	TOTAL	42708.5329	1611			
	N	246	1136	232	1614	BETWEEN GROUPS	2956.0099	2	1478.0050	47.2198	0.0542
53	M	11.549	14.064	16.522	14.034	WITHIN GROUPS	50425.1159	1611	31.3005		
	SD	5.306	5.638	5.680	5.753	TOTAL	53381.1258	1613			
	N	243	1137	232	1612	BETWEEN GROUPS	3276.3277	2	1638.1639	60.8283	0.0691
54	M	11.033	13.860	16.267	13.780	WITHIN GROUPS	43331.9328	1609	26.9310		
	SD	5.057	5.177	5.386	5.379	TOTAL	46608.2605	1611			
	N	247	1131	232	1610	BETWEEN GROUPS	3987.0315	2	1993.5158	87.4406	0.0970
55	M	12.632	15.549	18.401	15.512	WITHIN GROUPS	36637.2200	1607	22.7985		
	SD	4.914	4.794	4.522	5.025	TOTAL	40624.2516	1609			
	N	245	1121	231	1597	BETWEEN GROUPS	3298.9303	2	1649.4652	57.3644	0.0659
56	M	12.841	15.384	18.108	15.388	WITHIN GROUPS	45834.1442	1594	28.7542		
	SD	5.226	5.393	5.356	5.548	TOTAL	49133.0745	1596			
	N	319	1495	343	2157	BETWEEN GROUPS	124485.6321	2	62242.8160	2879.9145	0.7275
57	M	86.320	99.945	113.746	100.125	WITHIN GROUPS	46553.8209	2154	21.6127		
	SD	4.955	4.504	4.966	8.907	TOTAL	171039.4529	2156			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D: COMBINED SAMPLES-Low IQ

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 8 WITH RANGE OF 50.000 TO 99.000

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE 0.0 , 0.0 , 0.0 , -9.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 1.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 3921 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D: COMBINED SAMPLES - Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	217	1042	235	1494	BETWEEN GROUPS	1619.9243	2	809.9621	10.4796	0.0125
1	M	141.834	142.921	145.400	143.153	WITHIN GROUPS	115237.9747	1491	77.2891		
	SD	8.368	8.645	9.764	8.847	TOTAL	116857.8989	1493			
	N	201	989	223	1413	BETWEEN GROUPS	38.7701	2	19.3851	8.4224	0.0104
2	M	4.597	4.508	4.076	4.452	WITHIN GROUPS	3245.2554	1410	2.3016		
	SD	1.429	1.499	1.668	1.525	TOTAL	3284.0255	1412			
	N	206	986	224	1416	BETWEEN GROUPS	11.4389	2	5.7195	2.7721	0.0025
3	M	4.456	4.368	4.152	4.347	WITHIN GROUPS	2915.3061	1413	2.0632		
	SD	1.423	1.452	1.377	1.438	TOTAL	2926.7451	1415			
	N	217	1042	235	1494	BETWEEN GROUPS	40.0497	2	20.0249	3.5291	0.0034
4	M	2.995	3.019	2.566	2.944	WITHIN GROUPS	8460.3392	1491	5.6743		
	SD	2.272	2.448	2.176	2.386	TOTAL	8500.3889	1493			
	N	201	966	222	1389	BETWEEN GROUPS	21.3806	2	10.6903	5.4129	0.0063
5	M	5.005	4.945	4.622	4.902	WITHIN GROUPS	2737.3034	1386	1.9750		
	SD	1.279	1.401	1.528	1.410	TOTAL	2758.6839	1388			
	N	203	974	224	1401	BETWEEN GROUPS	10.5134	2	5.2567	5.7369	0.0067
6	M	3.852	3.847	3.612	3.810	WITHIN GROUPS	1280.9827	1398	0.9163		
	SD	0.900	0.947	1.049	0.960	TOTAL	1291.4961	1400			
	N	203	961	220	1384	BETWEEN GROUPS	2432.2664	2	1216.1332	65.9613	0.0858
7	M	13.818	16.602	18.591	16.510	WITHIN GROUPS	25461.5920	1381	18.4371		
	SD	3.990	4.364	4.254	4.491	TOTAL	27893.8584	1383			
	N	217	1042	235	1494	BETWEEN GROUPS	2533.0639	2	1266.5319	11.6546	0.0141
8	M	87.659	86.056	83.098	85.823	WITHIN GROUPS	162030.2855	1491	108.6722		
	SD	8.416	10.489	11.732	10.499	TOTAL	164563.3494	1493			
	N	120	598	109	827	BETWEEN GROUPS	2.8400	2	1.4200	0.6024	-0.0010
9	M	2.925	2.953	3.119	2.971	WITHIN GROUPS	1942.4635	824	2.3574		
	SD	1.540	1.519	1.620	1.535	TOTAL	1945.3035	826			
	N	132	649	121	902	BETWEEN GROUPS	8.6277	2	4.3138	2.2914	0.0029
10	M	2.629	2.641	2.926	2.677	WITHIN GROUPS	1692.4910	899	1.8826		
	SD	1.432	1.364	1.349	1.374	TOTAL	1701.1186	901			
	N	155	730	139	1024	BETWEEN GROUPS	6.6074	2	3.3037	1.9123	0.0018
11	M	2.910	2.700	2.827	2.749	WITHIN GROUPS	1763.8516	1021	1.7276		
	SD	1.350	1.303	1.335	1.316	TOTAL	1770.4990	1023			
	N	169	793	155	1117	BETWEEN GROUPS	4.7646	2	2.3823	1.2696	0.0005
12	M	2.550	2.473	2.658	2.510	WITHIN GROUPS	2090.3670	1114	1.8765		
	SD	1.345	1.359	1.452	1.370	TOTAL	2095.1316	1116			

LLCYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLCYD 1-14C: COMBINED SAMPLES -Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	143	627	119	889	BETWEEN GROUPS	4114.5895	2	2057.2947	35.4517	0.0719
13	M	28.070	32.126	35.992	31.991	WITHIN GROUPS	51415.3385	886	58.0309		
	SD	7.354	7.574	8.144	7.908	TOTAL	55529.9280	888			
	N	211	1000	232	1443	BETWEEN GROUPS	59113.5016	2	29556.7508	114.1702	0.1396
14	M	32.758	43.341	55.759	43.790	WITHIN GROUPS	372791.8747	1440	258.8832		
	SD	27.173	13.601	11.942	17.307	TOTAL	431905.3763	1442			
	N	170	845	175	1190	BETWEEN GROUPS	4.5378	2	2.2689	9.0156	0.0133
15	M	2.459	2.554	2.686	2.560	WITHIN GROUPS	298.7261	1187	0.2517		
	SD	0.500	0.504	0.490	0.505	TOTAL	303.2639	1189			
	N	211	997	232	1440	BETWEEN GROUPS	31637.9924	2	15818.9962	225.1432	0.2374
16	M	41.967	50.429	58.875	50.550	WITHIN GROUPS	100966.4076	1437	70.2619		
	SD	7.406	8.267	9.621	9.599	TOTAL	132604.4000	1439			
	N	138	680	129	947	BETWEEN GROUPS	1036.0580	2	518.0290	2.2843	0.0027
17	M	94.036	96.384	97.891	96.247	WITHIN GROUPS	214082.1215	944	226.7819		
	SD	15.417	14.851	15.752	15.080	TOTAL	215118.1795	946			
	N	217	1042	235	1494	BETWEEN GROUPS	57482.5666	2	28741.2833	386.2083	0.3402
18	M	34.765	46.022	57.323	46.165	WITHIN GROUPS	110958.9274	1491	74.4191		
	SD	6.623	8.746	9.663	10.622	TOTAL	168441.4940	1493			
	N	215	1028	233	1476	BETWEEN GROUPS	5875.5247	2	2937.7623	53.5929	0.0665
19	M	50.395	54.208	57.644	54.195	WITHIN GROUPS	80744.2802	1473	54.8162		
	SD	7.087	7.439	7.533	7.663	TOTAL	86619.8049	1475			
	N	216	1021	233	1470	BETWEEN GROUPS	12817.3053	2	6408.6527	87.1890	0.1050
20	M	46.750	52.931	57.386	52.729	WITHIN GROUPS	107828.9368	1467	73.5030		
	SD	7.676	8.737	8.637	9.062	TOTAL	120646.2422	1469			
	N	195	945	208	1348	BETWEEN GROUPS	3004.7261	2	1502.3631	31.5945	0.0434
21	M	21.913	24.268	27.327	24.399	WITHIN GROUPS	63956.5528	1345	47.5513		
	SD	5.808	6.916	7.695	7.051	TOTAL	66961.2789	1347			
	N	195	945	208	1348	BETWEEN GROUPS	2943.7310	2	1471.8655	29.5485	0.0406
22	M	22.415	24.387	27.678	24.610	WITHIN GROUPS	66997.0197	1345	49.8119		
	SD	6.321	7.006	7.898	7.206	TOTAL	69940.7507	1347			
	N	158	815	181	1154	BETWEEN GROUPS	1031.0002	2	515.5001	8.1937	0.0123
23	M	22.095	23.452	25.503	23.588	WITHIN GROUPS	72414.6602	1151	62.9146		
	SD	7.309	7.821	8.895	7.981	TOTAL	73445.6603	1153			
	N	195	945	208	1348	BETWEEN GROUPS	1775.3953	2	887.6976	17.1188	0.0234
24	M	21.600	23.622	25.793	23.665	WITHIN GROUPS	69745.0439	1345	51.8551		
	SD	6.728	7.099	8.042	7.287	TOTAL	71520.4392	1347			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14D: COMBINED SAMPLES-Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	77	438	106	621	BETWEEN GROUPS	142.9400	2	71.4700	0.9583	-0.0001
25	M	22.974	22.947	24.226	23.169	WITHIN GROUPS	46090.3063	618	74.5798		
	SD	8.169	8.459	9.637	8.635	TOTAL	46233.2464	620			
	N	193	941	206	1340	BETWEEN GROUPS	1144.8472	2	572.4236	10.1758	0.0135
26	M	28.746	29.925	32.024	30.078	WITHIN GROUPS	75211.0812	1337	56.2536		
	SD	6.725	7.598	7.735	7.551	TOTAL	76355.9284	1339			
	N	27	152	59	238	BETWEEN GROUPS	732.3395	2	366.1697	3.6175	0.0215
27	M	17.704	20.428	23.576	20.899	WITHIN GROUPS	23787.2404	235	101.2223		
	SD	9.285	9.864	10.869	10.171	TOTAL	24519.5798	237			
	N	191	932	203	1326	BETWEEN GROUPS	2219.8955	2	1109.9478	13.9355	0.0191
28	M	29.414	31.817	34.163	31.830	WITHIN GROUPS	105375.5856	1323	79.6490		
	SD	8.860	8.846	9.338	9.011	TOTAL	107595.4811	1325			
	N	181	904	198	1283	BETWEEN GROUPS	729.9659	2	364.9830	5.2795	0.0066
29	M	29.094	30.374	31.859	30.422	WITHIN GROUPS	88489.0676	1280	69.1321		
	SD	8.189	8.405	8.006	8.342	TOTAL	89219.0335	1282			
	N	194	936	203	1333	BETWEEN GROUPS	732.6014	2	366.3007	5.1677	0.0062
30	M	33.577	33.553	35.621	33.872	WITHIN GROUPS	94274.4624	1330	70.8831		
	SD	8.417	8.474	8.165	8.446	TOTAL	95007.0638	1332			
	N	193	950	207	1350	BETWEEN GROUPS	4237.0448	2	2118.5224	34.4908	0.0473
31	M	22.979	26.005	29.469	26.104	WITHIN GROUPS	82736.4367	1347	61.4227		
	SD	6.844	7.820	8.733	8.029	TOTAL	86973.4815	1349			
	N	180	890	193	1263	BETWEEN GROUPS	2977.9211	2	1488.9605	22.4855	0.0329
32	M	22.683	25.343	28.321	25.419	WITHIN GROUPS	83435.5104	1260	66.2187		
	SD	7.482	7.926	9.564	8.275	TOTAL	86413.4315	1262			
	N	152	812	178	1142	BETWEEN GROUPS	838.1202	2	419.0601	7.0978	0.0106
33	M	24.355	25.259	27.326	25.461	WITHIN GROUPS	67247.6066	1139	59.0409		
	SD	7.105	7.579	8.583	7.725	TOTAL	68085.7268	1141			
	N	130	699	165	994	BETWEEN GROUPS	740.8054	2	370.4027	6.3268	0.0106
34	M	21.923	23.498	25.097	23.557	WITHIN GROUPS	58018.4260	991	58.5453		
	SD	6.881	7.556	8.576	7.692	TOTAL	58759.2314	993			
	N	98	545	127	770	BETWEEN GROUPS	489.3139	2	244.6569	5.0221	0.0103
35	M	23.796	24.571	26.488	24.788	WITHIN GROUPS	37365.1809	767	48.7160		
	SD	6.974	6.896	7.334	7.016	TOTAL	37854.4948	769			
	N	79	461	116	656	BETWEEN GROUPS	540.9272	2	270.4636	6.1771	0.0155
36	M	25.734	27.505	29.103	27.575	WITHIN GROUPS	28591.4128	653	43.7847		
	SD	6.652	6.513	6.996	6.669	TOTAL	29132.3399	655			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-140: COMBINED SAMPLES -Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	189	925	203	1317						
37	M	83.794	88.618	93.286	88.645	BETWEEN GROUPS	8820.7362	2	4410.3681	35.7799	0.0302
	SD	9.467	11.127	12.330	11.392	WITHIN GROUPS	161968.6685	1314	123.2638		
						TOTAL	170789.4047	1316			
	N	111	622	140	873						
38	M	89.640	92.249	96.686	92.629	BETWEEN GROUPS	3385.6210	2	1692.8105	13.7616	0.0304
	SD	10.187	10.986	12.190	11.252	WITHIN GROUPS	107018.1316	870	123.0093		
						TOTAL	110403.7526	872			
	N	58	390	97	545						
39	M	3.362	3.200	3.165	3.211	BETWEEN GROUPS	1.5766	2	0.7883	0.4579	-0.0020
	SD	1.280	1.315	1.320	1.311	WITHIN GROUPS	933.1574	542	1.7217		
						TOTAL	934.7339	544			
	N	171	874	194	1239						
40	M	46.977	52.025	60.433	52.645	BETWEEN GROUPS	17596.7634	2	8798.3817	50.1224	0.0389
	SD	11.735	13.060	15.212	13.765	WITHIN GROUPS	216964.9815	1236	175.5380		
						TOTAL	234561.7450	1238			
	N	180	882	196	1258						
41	M	44.789	51.734	57.852	51.693	BETWEEN GROUPS	16016.4876	2	8008.2438	47.2155	0.0364
	SD	10.295	12.938	15.427	13.494	WITHIN GROUPS	212861.0736	1255	169.6104		
						TOTAL	228877.5612	1257			
	N	156	804	187	1147						
42	M	37.936	44.954	52.187	45.207	BETWEEN GROUPS	17355.2526	2	8697.6263	29.2104	0.0400
	SD	15.545	17.005	19.535	17.675	WITHIN GROUPS	340634.7771	1144	297.7577		
						TOTAL	358030.0296	1146			
	N	179	859	191	1229						
43	M	54.128	56.239	59.325	56.411	BETWEEN GROUPS	2579.4980	2	1289.7490	12.8943	0.0198
	SD	9.473	9.810	11.259	10.098	WITHIN GROUPS	122629.9959	1226	100.0245		
						TOTAL	125209.4939	1228			
	N	161	827	189	1177						
44	M	47.739	52.255	58.603	52.657	BETWEEN GROUPS	10709.8816	2	5354.9408	47.3120	0.0738
	SD	9.486	10.346	12.645	11.050	WITHIN GROUPS	132877.4472	1174	113.1835		
						TOTAL	143587.3288	1176			
	N	96	483	119	698						
45	M	70.917	75.745	81.739	76.103	BETWEEN GROUPS	6424.6383	2	3212.3192	7.4960	0.0183
	SD	20.297	20.302	22.556	20.893	WITHIN GROUPS	297831.9347	695	428.5352		
						TOTAL	304256.5731	697			
	N	95	482	119	696						
46	M	70.905	78.568	88.261	79.180	BETWEEN GROUPS	16497.2379	2	8248.6189	21.2918	0.0581
	SD	20.643	19.194	20.832	20.249	WITHIN GROUPS	268473.3124	693	387.4074		
						TOTAL	284970.5503	695			
	N	95	483	119	697						
47	M	70.842	77.004	85.017	77.532	BETWEEN GROUPS	11052.9340	2	5526.4670	15.9200	0.0411
	SD	19.325	18.062	20.287	19.027	WITHIN GROUPS	240914.5897	694	347.1392		
						TOTAL	251967.5237	696			
	N	132	697	157	986						
48	M	7.818	8.901	10.287	8.977	BETWEEN GROUPS	450.5559	2	225.2780	12.7504	0.0233
	SD	4.028	4.219	4.279	4.253	WITHIN GROUPS	17367.9076	983	17.6683		
						TOTAL	17818.4635	985			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-140: COMBINED SAMPLES -Low IQ

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	129	696	161	986	BETWEEN GROUPS	529.2617	2	264.6309	10.9397	0.0198
49	M	8.496	9.418	11.075	9.568	WITHIN GROUPS	23778.6855	983	24.1899		
	SD	4.654	4.847	5.409	4.968	TOTAL	24307.9473	985			
	N	131	696	163	990	BETWEEN GROUPS	345.9572	2	172.9786	10.6078	0.0190
50	M	8.511	9.688	10.693	9.698	WITHIN GROUPS	16094.7388	987	16.3067		
	SD	3.941	3.998	4.279	4.077	TOTAL	16440.6960	989			
	N	131	692	160	983	BETWEEN GROUPS	221.8908	2	110.9454	5.1222	0.0083
51	M	8.496	9.116	10.175	9.205	WITHIN GROUPS	21226.5995	980	21.6598		
	SD	4.077	4.623	5.197	4.674	TOTAL	21448.4903	982			
	N	129	690	157	976	BETWEEN GROUPS	556.6541	2	278.3271	17.2890	0.0323
52	M	8.411	9.510	11.134	9.626	WITHIN GROUPS	15663.8449	973	16.0985		
	SD	3.878	3.829	4.828	4.079	TOTAL	16220.4990	975			
	N	129	698	160	987	BETWEEN GROUPS	635.6650	2	317.8325	15.7608	0.0290
53	M	7.380	8.504	10.256	8.641	WITHIN GROUPS	19843.3685	984	20.1660		
	SD	4.267	4.376	5.119	4.557	TOTAL	20479.0334	986			
	N	132	689	158	979	BETWEEN GROUPS	888.5240	2	444.2620	23.9980	0.0449
54	M	6.038	7.753	9.538	7.810	WITHIN GROUPS	18068.1379	976	18.5124		
	SD	3.877	4.209	4.991	4.403	TOTAL	18956.6619	978			
	N	134	685	164	983	BETWEEN GROUPS	626.0766	2	313.0383	16.8831	0.0313
55	M	8.015	9.149	10.841	9.277	WITHIN GROUPS	18170.6599	980	18.5415		
	SD	4.370	4.262	4.436	4.375	TOTAL	18796.7365	982			
	N	131	680	158	969	BETWEEN GROUPS	424.0661	2	212.0330	11.2644	0.0207
56	M	8.282	9.312	10.671	9.394	WITHIN GROUPS	18183.3416	966	18.8233		
	SD	4.443	4.169	4.929	4.384	TOTAL	18407.4076	968			
	N	217	1042	235	1494	BETWEEN GROUPS	75221.2234	2	37610.6117	1944.0076	0.7223
57	M	87.585	99.696	113.319	100.080	WITHIN GROUPS	28846.2981	1491	19.3469		
	SD	3.585	4.493	4.649	8.349	TOTAL	104067.5214	1493			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE MALES

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 0 WITH RANGE OF 0.0 TO 0.0

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE 0.0 , 0.0 , 0.0 , -9.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 1.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 1696 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	248	1105	271	1624	BETWEEN GROUPS	988.1333	2	494.0667	11.4009	0.0126
1	M	139.246	140.131	141.886	140.289	WITHIN GROUPS	70247.4227	1621	43.3359		
	SD	5.979	6.481	7.464	6.625	TOTAL	71235.5560	1623			
	N	235	1056	256	1547	BETWEEN GROUPS	27.9594	2	13.9797	4.6173	0.0047
2	M	3.881	3.586	3.410	3.602	WITHIN GROUPS	4674.7556	1544	3.0277		
	SD	1.680	1.747	1.765	1.744	TOTAL	4702.7149	1546			
	N	234	1060	255	1549	BETWEEN GROUPS	9.4179	2	4.7089	1.9643	0.0012
3	M	3.829	3.640	3.565	3.656	WITHIN GROUPS	3706.1806	1546	2.3973		
	SD	1.484	1.578	1.478	1.549	TOTAL	3715.5985	1548			
	N	248	1105	271	1624	BETWEEN GROUPS	22.5016	2	11.2508	3.8982	0.0036
4	M	2.161	2.030	1.764	2.006	WITHIN GROUPS	4678.4485	1621	2.8861		
	SD	1.797	1.742	1.402	1.702	TOTAL	4700.9501	1623			
	N	226	1040	252	1518	BETWEEN GROUPS	19.7984	2	9.8992	4.0366	0.0040
5	M	4.292	4.155	3.901	4.133	WITHIN GROUPS	3715.3215	1515	2.4524		
	SD	1.453	1.572	1.639	1.569	TOTAL	3735.1199	1517			
	N	235	1046	252	1533	BETWEEN GROUPS	11.5540	2	5.7770	4.3561	0.0044
6	M	3.391	3.228	3.083	3.229	WITHIN GROUPS	2029.0800	1530	1.3262		
	SD	1.098	1.149	1.210	1.154	TOTAL	2040.6341	1532			
	N	229	1022	247	1498	BETWEEN GROUPS	2137.2587	2	1068.6293	44.3720	0.0547
7	M	16.659	19.149	20.870	19.052	WITHIN GROUPS	36004.6799	1495	24.0834		
	SD	4.830	4.903	4.995	5.048	TOTAL	38141.9386	1497			
	N	248	1105	271	1624	BETWEEN GROUPS	352.4818	2	176.2409	0.6273	-0.0005
8	M	103.427	103.475	102.218	103.258	WITHIN GROUPS	455412.4141	1621	280.9454		
	SD	14.911	16.717	18.457	16.758	TOTAL	455764.8959	1623			
	N	123	576	130	829	BETWEEN GROUPS	8.4154	2	4.2077	2.2852	0.0031
9	M	2.854	2.946	3.192	2.971	WITHIN GROUPS	1520.8898	826	1.8413		
	SD	1.199	1.370	1.436	1.359	TOTAL	1529.3052	828			
	N	138	645	143	926	BETWEEN GROUPS	3.4270	2	1.7135	1.0672	0.0001
10	M	2.522	2.594	2.734	2.605	WITHIN GROUPS	1481.9121	923	1.6055		
	SD	1.185	1.278	1.294	1.267	TOTAL	1485.3391	925			
	N	163	734	166	1063	BETWEEN GROUPS	2.1160	2	1.0580	0.7378	-0.0005
11	M	2.767	2.654	2.729	2.683	WITHIN GROUPS	1520.0459	1060	1.4340		
	SD	1.205	1.176	1.281	1.197	TOTAL	1522.1618	1062			
	N	179	820	182	1181	BETWEEN GROUPS	1.2554	2	0.6277	0.4112	-0.0010
12	M	2.391	2.315	2.379	2.336	WITHIN GROUPS	1798.2907	1178	1.5266		
	SD	1.304	1.221	1.232	1.235	TOTAL	1799.5461	1180			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	154	714	161	1029	BETWEEN GROUPS	7235.6045	2	3617.8022	43.8964	0.0770
13	M	32.273	37.643	41.826	37.494	WITHIN GROUPS	84559.6045	1026	82.4168		
	SD	9.229	9.125	8.720	9.450	TOTAL	91795.2089	1028			
	N	248	1105	271	1624	BETWEEN GROUPS	102266.2003	2	51133.1001	116.5679	0.1266
14	M	41.169	56.483	69.251	56.275	WITHIN GROUPS	711059.7646	1621	438.6550		
	SD	13.405	23.086	17.030	22.386	TOTAL	813325.9649	1623			
	N	192	862	200	1254	BETWEEN GROUPS	2.0543	2	1.0272	4.7213	0.0050
15	M	2.646	2.711	2.790	2.714	WITHIN GROUPS	272.1698	1251	0.2176		
	SD	0.490	0.471	0.420	0.468	TOTAL	274.2241	1253			
	N	248	1102	271	1621	BETWEEN GROUPS	60946.7428	2	30473.3714	162.5090	0.1662
16	M	49.895	60.051	71.509	60.413	WITHIN GROUPS	303404.1554	1618	187.5180		
	SD	11.805	13.354	16.404	14.997	TOTAL	364350.8982	1620			
	N	158	744	173	1075	BETWEEN GROUPS	2888.3285	2	1444.1643	5.5147	0.0083
17	M	105.392	108.700	111.295	108.632	WITHIN GROUPS	280729.7962	1072	261.8748		
	SD	15.636	16.313	16.10	16.250	TOTAL	283618.1247	1074			
	N	248	1105	271	1624	BETWEEN GROUPS	86788.2115	2	43394.1057	230.6281	0.2285
18	M	44.306	57.468	70.188	57.581	WITHIN GROUPS	305001.2214	1621	188.1562		
	SD	11.543	13.767	15.257	15.537	TOTAL	391789.4329	1623			
	N	248	1093	267	1608	BETWEEN GROUPS	6101.0160	2	3050.5080	41.7712	0.0483
19	M	56.702	60.800	63.528	60.621	WITHIN GROUPS	117211.5785	1605	73.0290		
	SD	8.184	8.547	8.862	8.760	TOTAL	123312.5945	1607			
	N	245	1088	269	1602	BETWEEN GROUPS	13223.4285	2	6611.7143	65.7972	0.0748
20	M	53.192	59.068	63.301	58.880	WITHIN GROUPS	160677.5603	1599	100.4863		
	SD	9.805	10.091	9.950	10.422	TOTAL	173900.9888	1601			
	N	224	1007	237	1468	BETWEEN GROUPS	5920.4837	2	2960.2418	38.4564	0.0486
21	M	23.893	27.827	31.051	27.747	WITHIN GROUPS	112770.7554	1465	76.9766		
	SD	6.799	8.988	9.478	8.995	TOTAL	118691.2391	1467			
	N	224	1008	237	1469	BETWEEN GROUPS	5791.7496	2	2895.8748	34.4272	0.0435
22	M	25.040	28.607	32.131	28.632	WITHIN GROUPS	123314.0121	1466	84.1160		
	SD	7.641	9.299	9.918	9.378	TOTAL	129105.7617	1468			
	N	188	881	208	1277	BETWEEN GROUPS	2469.0288	2	1234.5144	13.4351	0.0191
23	M	24.447	27.061	29.447	27.065	WITHIN GROUPS	117064.5765	1274	91.8874		
	SD	8.340	9.612	10.485	9.679	TOTAL	119533.6053	1276			
	N	224	1007	237	1468	BETWEEN GROUPS	5379.3459	2	2689.6730	30.9321	0.0392
24	M	23.991	27.865	30.797	27.747	WITHIN GROUPS	127387.8932	1465	86.9542		
	SD	7.672	9.501	9.968	9.513	TOTAL	132767.2391	1467			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	89	428	109	626	BETWEEN GROUPS	972.0527	2	486.0264	4.4380	0.0109
25	M	23.236	25.769	27.688	25.743	WITHIN GROUPS	68227.5399	623	109.5145		
	SD	8.956	10.556	11.219	10.522	TOTAL	69199.5927	625			
	N	224	1004	235	1463	BETWEEN GROUPS	1540.2401	2	770.1200	10.8147	0.0132
26	M	30.750	32.553	34.413	32.576	WITHIN GROUPS	103967.1639	1460	71.2104		
	SD	7.184	8.593	8.869	8.495	TOTAL	105507.4040	1462			
	N	78	472	125	675	BETWEEN GROUPS	2545.6205	2	1272.8102	8.5552	0.0219
27	M	20.372	25.292	27.608	25.153	WITHIN GROUPS	99977.6625	672	148.7763		
	SD	10.111	12.475	12.315	12.333	TOTAL	102523.2830	674			
	N	222	990	233	1445	BETWEEN GROUPS	2909.8654	2	1454.9327	15.7966	0.0201
28	M	30.815	34.169	35.665	33.895	WITHIN GROUPS	132814.1456	1442	92.1041		
	SD	9.043	9.662	9.830	9.695	TOTAL	135724.0111	1444			
	N	210	932	210	1352	BETWEEN GROUPS	870.3222	2	435.1611	5.1155	0.0061
29	M	29.400	31.231	32.186	31.095	WITHIN GROUPS	114755.5595	1349	85.0671		
	SD	8.752	9.382	8.965	9.251	TOTAL	115625.8817	1351			
	N	223	1002	235	1460	BETWEEN GROUPS	456.7189	2	228.3594	4.0250	0.0041
30	M	37.381	38.384	39.379	38.391	WITHIN GROUPS	82662.9654	1457	56.7350		
	SD	6.867	7.779	7.046	7.548	TOTAL	83119.6842	1459			
	N	225	1005	241	1471	BETWEEN GROUPS	7831.0159	2	3915.5079	40.7063	0.0512
31	M	25.684	30.404	33.846	30.246	WITHIN GROUPS	141205.8991	1468	96.1893		
	SD	8.421	10.053	9.971	10.069	TOTAL	149036.9150	1470			
	N	210	943	223	1376	BETWEEN GROUPS	6140.9250	2	3070.4625	29.7236	0.0401
32	M	25.895	29.785	33.430	29.782	WITHIN GROUPS	141831.6680	1373	103.3006		
	SD	8.719	10.285	10.883	10.374	TOTAL	147972.5930	1375			
	N	191	894	211	1296	BETWEEN GROUPS	2628.7927	2	1314.3963	14.9767	0.0211
33	M	26.387	29.365	31.483	29.271	WITHIN GROUPS	113477.1448	1293	87.7627		
	SD	7.727	9.483	10.194	9.469	TOTAL	116105.9375	1295			
	N	178	816	199	1193	BETWEEN GROUPS	2181.7651	2	1090.8825	11.6829	0.0176
34	M	24.157	26.635	28.975	26.655	WITHIN GROUPS	111115.6414	1190	93.3745		
	SD	7.637	9.889	10.319	9.749	TOTAL	113297.4065	1192			
	N	144	663	168	975	BETWEEN GROUPS	1140.3392	2	570.1696	7.8909	0.0139
35	M	25.229	27.585	29.030	27.486	WITHIN GROUPS	70233.2238	972	72.2564		
	SD	7.270	8.591	9.095	8.560	TOTAL	71373.5631	974			
	N	124	598	156	878	BETWEEN GROUPS	1324.0364	2	662.0182	10.9898	0.0222
36	M	27.032	29.741	31.385	29.650	WITHIN GROUPS	52709.6185	875	60.2396		
	SD	6.542	7.804	8.457	7.849	TOTAL	54033.6549	877			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	221	984	228	1433	BETWEEN GROUPS	17696.2708	2	8848.1354	36.9834	0.0478
37	M	94.851	101.621	107.390	101.495	WITHIN GROUPS	342121.9399	1430	239.2461		
	SD	13.729	15.538	16.703	15.851	TOTAL	359818.2107	1432			
	N	156	717	178	1051	BETWEEN GROUPS	8443.2992	2	4221.6496	19.2780	0.0336
38	M	100.083	107.282	109.489	106.587	WITHIN GROUPS	229499.4849	1048	218.9881		
	SD	14.110	14.738	15.610	15.054	TOTAL	237942.7840	1050			
	N	85	434	112	631	BETWEEN GROUPS	3.5342	2	1.7671	1.1058	0.0003
39	M	2.835	2.641	2.768	2.689	WITHIN GROUPS	1003.5847	628	1.5981		
	SD	1.174	1.289	1.230	1.264	TOTAL	1007.1189	630			
	N	210	956	231	1397	BETWEEN GROUPS	47164.2005	2	23582.1003	54.7677	0.0715
40	M	58.067	68.417	78.758	68.571	WITHIN GROUPS	600233.9627	1394	430.5839		
	SD	18.102	20.861	22.473	21.535	TOTAL	647398.1632	1396			
	N	216	963	232	1411	BETWEEN GROUPS	21608.2673	2	10804.1336	36.3013	0.0477
41	M	52.977	60.787	66.836	60.586	WITHIN GROUPS	419054.0205	1408	297.6236		
	SD	14.718	17.534	18.223	17.678	TOTAL	440662.2877	1410			
	N	196	921	228	1345	BETWEEN GROUPS	39009.9207	2	19504.9603	35.4862	0.0488
42	M	47.903	59.119	67.083	58.835	WITHIN GROUPS	737629.4369	1342	549.6494		
	SD	19.706	23.639	25.516	24.039	TOTAL	776639.3576	1344			
	N	215	956	228	1399	BETWEEN GROUPS	8915.0368	2	4457.5184	24.1561	0.0320
43	M	61.553	67.027	70.399	66.736	WITHIN GROUPS	257603.1076	1396	184.5294		
	SD	11.744	13.815	14.207	13.807	TOTAL	266518.1444	1398			
	N	201	911	224	1336	BETWEEN GROUPS	23281.3776	2	11640.6888	44.0756	0.0606
44	M	57.025	65.226	71.835	65.100	WITHIN GROUPS	352055.1822	1333	264.1074		
	SD	13.523	16.553	17.223	16.768	TOTAL	375336.5599	1335			
	N	139	652	154	945	BETWEEN GROUPS	15912.7585	2	7956.3793	16.2188	0.0312
45	M	85.683	95.121	100.117	94.547	WITHIN GROUPS	462113.3960	942	490.5662		
	SD	23.513	21.986	21.562	22.503	TOTAL	478026.1545	944			
	N	138	651	154	943	BETWEEN GROUPS	27919.1184	2	13959.5592	31.7451	0.0612
46	M	85.391	97.504	104.714	96.909	WITHIN GROUPS	413355.0385	940	439.7394		
	SD	23.664	20.791	19.072	21.644	TOTAL	441274.1569	942			
	N	138	652	154	944	BETWEEN GROUPS	21243.2357	2	10621.6178	25.3188	0.0490
47	M	85.580	96.184	102.422	95.651	WITHIN GROUPS	394763.1022	941	419.5145		
	SD	22.336	20.347	19.285	21.004	TOTAL	416006.3379	943			
	N	163	771	177	1111	BETWEEN GROUPS	1323.1613	2	661.5807	21.4084	0.0354
48	M	10.926	13.450	14.780	13.292	WITHIN GROUPS	34240.3508	1108	30.9028		
	SD	5.426	5.537	5.774	5.660	TOTAL	35563.5122	1110			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	164	760	176	1100	BETWEEN GROUPS	945.0978	2	472.5489	13.0951	0.0215
49	M	13.030	15.159	16.284	15.022	WITHIN GROUPS	39586.3785	1097	36.0860		
	SD	6.144	5.928	6.214	6.073	TOTAL	40531.4764	1099			
	N	166	766	188	1120	BETWEEN GROUPS	1160.6220	2	580.3110	24.2861	0.0399
50	M	10.494	12.714	14.085	12.615	WITHIN GROUPS	26690.5200	1117	23.8948		
	SD	4.215	4.896	5.383	4.989	TOTAL	27851.1420	1119			
	N	166	769	186	1121	BETWEEN GROUPS	1062.9479	2	531.4739	14.4682	0.0235
51	M	12.976	14.822	16.457	14.820	WITHIN GROUPS	41068.6525	1118	36.7340		
	SD	5.430	6.117	6.354	6.133	TOTAL	42131.6004	1120			
	N	165	772	180	1117	BETWEEN GROUPS	1744.8569	2	872.4285	29.1070	0.0479
52	M	11.224	13.924	15.683	13.808	WITHIN GROUPS	33390.1440	1114	29.9732		
	SD	5.034	5.455	5.927	5.611	TOTAL	35135.0009	1116			
	N	165	774	184	1123	BETWEEN GROUPS	1396.8227	2	698.4113	18.8555	0.0308
53	M	10.436	13.022	14.348	12.859	WITHIN GROUPS	41484.9476	1120	37.0401		
	SD	5.660	6.034	6.645	6.182	TOTAL	42881.7703	1122			
	N	163	777	181	1121	BETWEEN GROUPS	1783.9981	2	891.9990	28.6489	0.0470
54	M	8.736	11.649	13.199	11.475	WITHIN GROUPS	34809.5773	1118	31.1356		
	SD	5.289	5.471	6.259	5.716	TOTAL	36593.5754	1120			
	N	167	774	182	1123	BETWEEN GROUPS	1867.8676	2	933.9338	32.8263	0.0536
55	M	10.922	13.749	15.495	13.612	WITHIN GROUPS	31864.8572	1120	28.4508		
	SD	4.960	5.345	5.610	5.483	TOTAL	33732.7248	1122			
	N	166	766	182	1114	BETWEEN GROUPS	1417.3516	2	708.6758	22.5339	0.0372
56	M	11.060	13.567	15.038	13.434	WITHIN GROUPS	34940.2328	1111	31.4494		
	SD	5.700	5.517	5.896	5.715	TOTAL	36357.5844	1113			
	N	248	1105	271	1624	BETWEEN GROUPS	93510.8077	2	46755.4039	2261.4379	0.7357
57	M	86.766	99.882	113.598	100.168	WITHIN GROUPS	33514.3000	1621	20.6751		
	SD	4.028	4.546	4.979	8.847	TOTAL	127025.1078	1623			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE FEMALES

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 0 WITH RANGE OF 0.0 TO 0.0

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE 0.0 , 0.0 , 0.0 , -9.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 1.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 1670 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	240	1116	244	1600	BETWEEN GROUPS	1125.3345	2	562.6673	20.0973	0.0233
1	M	137.329	138.802	140.377	138.821	WITHIN GROUPS	44711.5430	1597	27.9972		
	SD	5.166	5.280	5.460	5.354	TOTAL	45836.8775	1599			
	N	231	1068	235	1534	BETWEEN GROUPS	98.4637	2	49.2318	16.6334	0.0200
2	M	4.052	3.684	3.145	3.656	WITHIN GROUPS	4531.4874	1531	2.9598		
	SD	1.646	1.709	1.839	1.738	TOTAL	4629.9511	1533			
	N	231	1073	236	1540	BETWEEN GROUPS	24.7846	2	12.3923	5.2660	0.0055
3	M	3.931	3.709	3.470	3.706	WITHIN GROUPS	3616.9628	1537	2.3533		
	SD	1.485	1.546	1.525	1.538	TOTAL	3641.7474	1539			
	N	240	1116	244	1600	BETWEEN GROUPS	7.1465	2	3.5732	1.2844	0.0004
4	M	2.129	2.056	1.898	2.043	WITHIN GROUPS	4442.8779	1597	2.7820		
	SD	1.625	1.735	1.371	1.668	TOTAL	4450.0244	1599			
	N	229	1048	233	1510	BETWEEN GROUPS	70.8532	2	35.4266	15.4718	0.0188
5	M	4.489	4.158	3.712	4.140	WITHIN GROUPS	3450.6627	1507	2.2898		
	SD	1.416	1.511	1.610	1.528	TOTAL	3521.5159	1509			
	N	228	1061	235	1524	BETWEEN GROUPS	44.8174	2	22.4087	17.8771	0.0217
6	M	3.482	3.260	2.877	3.234	WITHIN GROUPS	1906.5547	1521	1.2535		
	SD	1.022	1.120	1.204	1.132	TOTAL	1951.3720	1523			
	N	228	1046	231	1505	BETWEEN GROUPS	2507.2801	2	1253.6400	55.7434	0.0678
7	M	18.399	20.760	23.074	20.757	WITHIN GROUPS	33779.1983	1502	22.4895		
	SD	5.159	4.653	4.717	4.912	TOTAL	36286.4784	1504			
	N	240	1116	244	1600	BETWEEN GROUPS	60.5366	2	30.2683	0.1319	-0.0011
8	M	106.075	105.552	105.467	105.617	WITHIN GROUPS	[illegible]469.3734	1597	229.4736		
	SD	14.201	14.778	17.541	15.140	TOTAL	366[illegible]9.9100	1599			
	N	125	581	114	820	BETWEEN GROUPS	8.0705	2	4.0353	2.1431	0.0028
9	M	2.832	3.107	3.114	3.066	WITHIN GROUPS	1538.3734	817	1.8830		
	SD	1.230	1.414	1.302	1.374	TOTAL	1546.4439	819			
	N	137	655	134	926	BETWEEN GROUPS	3.3018	2	1.6509	0.9668	-0.0001
10	M	2.708	2.756	2.910	2.771	WITHIN GROUPS	1576.1626	923	1.7077		
	SD	1.208	1.322	1.329	1.307	TOTAL	1579.4644	925			
	N	157	756	153	1066	BETWEEN GROUPS	5.8756	2	2.9378	1.7703	0.0014
11	M	2.790	2.856	3.046	2.873	WITHIN GROUPS	1764.0278	1063	1.6595		
	SD	1.149	1.310	1.315	1.289	TOTAL	1769.9034	1065			
	N	179	830	173	1182	BETWEEN GROUPS	1.0827	2	0.5414	0.3707	-0.0011
12	M	2.346	2.431	2.405	2.415	WITHIN GROUPS	1721.7870	1179	1.4604		
	SD	1.182	1.205	1.252	1.208	TOTAL	1722.8697	1181			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	142	694	129	965	BETWEEN GROUPS	5146.8149	2	2573.4075	39.0240	0.0730
13	M	36.563	41.039	45.271	40.946	WITHIN GROUPS	63438.3830	962	65.9443		
	SD	8.918	8.094	7.299	8.435	TOTAL	68585.1979	964			
	N	240	1116	244	1600	BETWEEN GROUPS	85046.4991	2	42523.2496	136.2511	0.1446
14	M	48.008	61.296	74.520	61.319	WITHIN GROUPS	498415.3002	1597	312.0947		
	SD	26.779	15.678	14.763	19.102	TOTAL	583461.7994	1599			
	N	194	867	173	1234	BETWEEN GROUPS	1.0878	2	0.5439	3.2203	0.0036
15	M	2.773	2.806	2.879	2.811	WITHIN GROUPS	207.9179	1231	0.1689		
	SD	0.444	0.410	0.377	0.412	TOTAL	209.0057	1233			
	N	240	1116	243	1599	BETWEEN GROUPS	57844.2941	2	28922.1471	163.5015	0.1689
16	M	55.179	63.617	76.700	64.339	WITHIN GROUPS	282319.9886	1596	176.8922		
	SD	16.956	11.849	15.355	14.590	TOTAL	340164.2827	1598			
	N	147	733	143	1023	BETWEEN GROUPS	3849.2529	2	1924.6265	8.0810	0.0137
17	M	105.537	108.274	112.699	108.500	WITHIN GROUPS	242930.4968	1020	238.1672		
	SD	15.767	15.279	15.867	15.539	TOTAL	246779.7498	1022			
	N	240	1116	244	1600	BETWEEN GROUPS	83158.8284	2	41579.4142	302.0223	0.2734
18	M	49.246	61.911	75.447	62.076	WITHIN GROUPS	219859.0210	1597	137.6700		
	SD	10.716	11.511	13.560	13.766	TOTAL	303017.8494	1599			
	N	234	1103	244	1581	BETWEEN GROUPS	4582.5928	2	2291.2964	41.1585	0.0483
19	M	58.833	62.165	65.020.	62.113	WITHIN GROUPS	87847.3667	1578	55.6701		
	SD	7.946	7.315	7.636	7.649	TOTAL	92429.9595	1580			
	N	235	1096	239	1570	BETWEEN GROUPS	11384.0980	2	5692.0490	69.6847	0.0805
20	M	58.898	64.514	68.628	64.299	WITHIN GROUPS	127997.2014	1567	81.6830		
	SD	9.555	8.942	8.953	9.425	TOTAL	139381.2994	1569			
	N	224	1013	213	1450	BETWEEN GROUPS	5415.0074	2	2707.5037	35.3770	0.0453
21	M	30.143	33.328	37.174	33.401	WITHIN GROUPS	110743.1919	1447	76.5330		
	SD	8.415	8.815	8.772	8.953	TOTAL	116158.1993	1449			
	N	224	1013	213	1450	BETWEEN GROUPS	6072.6212	2	3036.3106	38.1718	0.0488
22	M	29.969	33.174	37.394	33.299	WITHIN GROUPS	115099.0760	1447	79.5432		
	SD	8.594	8.998	8.872	9.145	TOTAL	121171.6972	1449			
	N	201	912	187	1300	BETWEEN GROUPS	3926.3861	2	1963.1931	22.2594	0.0317
23	M	27.891	30.596	34.230	30.701	WITHIN GROUPS	114390.2131	1297	88.1960		
	SD	8.287	9.599	9.479	9.544	TOTAL	118316.5992	1299			
	N	224	1013	213	1450	BETWEEN GROUPS	2833.5523	2	1416.7762	16.8150	0.0213
24	M	29.817	31.862	34.864	31.987	WITHIN GROUPS	121919.1987	1447	84.2565		
	SD	8.782	9.198	9.491	9.279	TOTAL	124752.7510	1449			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	159	746	139	1044	BETWEEN GROUPS	1207.3457	2	603.6729	5.4035	0.0084
25	M	28.698	29.713	32.518	29.932	WITHIN GROUPS	116298.8257	1041	111.7184		
	SD	9.089	10.658	11.614	10.614	TOTAL	117506.1715	1043			
	N	221	1007	213	1441	BETWEEN GROUPS	2772.7984	2	1386.3992	19.7430	0.0254
26	M	33.602	35.888	38.648	35.945	WITHIN GROUPS	100979.8706	1438	70.2224		
	SD	8.024	8.456	8.379	8.488	TOTAL	103752.6690	1440			
	N	64	391	102	557	BETWEEN GROUPS	3334.5988	2	1667.2994	12.6733	0.0402
27	M	27.797	31.974	36.725	32.364	WITHIN GROUPS	72884.4173	554	131.5603		
	SD	11.416	11.505	11.367	11.708	TOTAL	76219.0162	556			
	N	221	1001	209	1431	BETWEEN GROUPS	2252.4211	2	1126.2105	19.5755	0.0253
28	M	38.240	40.517	42.818	40.502	WITHIN GROUPS	82155.3246	1428	57.5317		
	SD	7.792	7.572	7.426	7.683	TOTAL	84407.7456	1430			
	N	213	935	201	1349	BETWEEN GROUPS	1566.0250	2	783.0125	12.3763	0.0166
29	M	35.826	37.580	39.711	37.620	WITHIN GROUPS	85157.6504	1346	63.2672		
	SD	7.996	7.979	7.790	8.021	TOTAL	86723.6753	1348			
	N	222	1006	210	1438	BETWEEN GROUPS	976.5839	2	488.2920	8.1968	0.0099
30	M	36.559	38.037	39.567	38.032	WITHIN GROUPS	85483.9446	1435	59.5707		
	SD	7.461	7.758	7.793	7.757	TOTAL	86460.5285	1437			
	N	225	1013	212	1450	BETWEEN GROUPS	7534.1635	2	3767.0817	40.4852	0.0516
31	M	31.467	35.415	39.774	35.439	WITHIN GROUPS	134640.9958	1447	93.0484		
	SD	9.758	9.678	9.371	9.906	TOTAL	142175.1593	1449			
	N	211	957	204	1372	BETWEEN GROUPS	5685.4738	2	2842.7369	28.7779	0.0389
32	M	30.848	34.231	38.240	34.307	WITHIN GROUPS	135232.3418	1369	98.7818		
	SD	9.364	9.949	10.454	10.138	TOTAL	140917.8156	1371			
	N	200	918	192	1310	BETWEEN GROUPS	3540.4146	2	1770.2073	21.2858	0.0300
33	M	30.515	33.235	36.516	33.301	WITHIN GROUPS	108695.0846	1307	83.1638		
	SD	8.042	9.258	9.496	9.260	TOTAL	112235.4992	1309			
	N	190	864	181	1235	BETWEEN GROUPS	3148.4106	2	1574.2053	18.1816	0.0271
34	M	28.237	30.318	33.945	30.530	WITHIN GROUPS	106669.2607	1232	86.5822		
	SD	8.160	9.413	9.894	9.434	TOTAL	109817.6713	1234			
	N	165	766	158	1089	BETWEEN GROUPS	2210.9740	2	1105.4870	13.9145	0.0232
35	M	29.218	31.087	34.342	31.276	WITHIN GROUPS	86280.8294	1086	79.4483		
	SD	7.859	9.117	8.943	9.019	TOTAL	88491.8035	1088			
	N	147	694	146	987	BETWEEN GROUPS	1388.1419	2	694.0710	11.8333	0.0215
36	M	32.313	34.406	36.664	34.429	WITHIN GROUPS	57715.5723	984	58.6540		
	SD	7.664	7.661	7.642	7.742	TOTAL	59103.7143	986			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	220	1005	215	1440	BETWEEN GROUPS	19022.3938	2	9511.1969	47.1826	0.0603
37	M	98.941	105.465	112.167	105.469	WITHIN GROUPS	289674.1999	1437	201.5826		
	SD	13.609	14.036	15.485	14.647	TOTAL	308696.5937	1439			
	N	171	778	155	1104	BETWEEN GROUPS	9659.8929	2	4829.9465	26.8462	0.0447
38	M	102.836	106.959	113.606	107.254	WITHIN GROUPS	198083.0926	1101	179.9120		
	SD	12.525	13.382	14.478	13.724	TOTAL	207742.9855	1103			
	N	110	537	117	764	BETWEEN GROUPS	1.4151	2	0.7076	0.4171	-0.0015
39	M	3.282	3.181	3.128	3.187	WITHIN GROUPS	1290.8191	761	1.6962		
	SD	1.321	1.301	1.290	1.301	TOTAL	1292.2343	763			
	N	212	989	209	1410	BETWEEN GROUPS	50595.7967	2	25297.8983	72.6193	0.0922
40	M	62.759	72.619	84.622	72.916	WITHIN GROUPS	490147.1601	1407	348.3633		
	SD	16.413	18.789	20.155	19.590	TOTAL	540742.9567	1409			
	N	219	993	211	1423	BETWEEN GROUPS	31948.6136	2	15974.3068	52.5312	0.0675
41	M	60.479	69.213	77.716	69.130	WITHIN GROUPS	431810.3351	1420	304.0918		
	SD	16.167	17.251	19.470	18.059	TOTAL	463758.9487	1422			
	N	209	982	208	1399	BETWEEN GROUPS	58790.8281	2	29395.4140	54.1289	0.0706
42	M	57.828	69.441	81.572	69.510	WITHIN GROUPS	758116.7917	1396	543.0636		
	SD	21.685	23.464	24.099	24.173	TOTAL	816907.6197	1398			
	N	211	977	207	1395	BETWEEN GROUPS	6366.6804	2	3183.3402	21.9297	0.0291
43	M	63.986	68.071	71.783	68.004	WITHIN GROUPS	202064.3017	1392	145.1611		
	SD	10.911	11.993	13.344	12.228	TOTAL	208430.9821	1394			
	N	202	953	205	1360	BETWEEN GROUPS	28424.5589	2	14212.2794	64.0271	0.0848
44	M	62.297	69.956	78.966	70.176	WITHIN GROUPS	301217.0882	1357	221.9728		
	SD	13.370	14.704	17.072	15.574	TOTAL	329641.6471	1359			
	N	161	740	151	1052	BETWEEN GROUPS	16848.5774	2	8424.2887	19.5742	0.0341
45	M	88.584	95.192	103.265	95.339	WITHIN GROUPS	451465.2733	1049	430.3768		
	SD	20.472	20.882	20.359	21.109	TOTAL	468313.8508	1051			
	N	160	740	151	1051	BETWEEN GROUPS	21959.3093	2	10979.6547	29.9382	0.0522
46	M	92.144	99.414	108.894	99.669	WITHIN GROUPS	384347.4633	1048	366.7438		
	SD	19.656	19.429	17.118	19.671	TOTAL	406306.7726	1050			
	N	161	740	151	1052	BETWEEN GROUPS	20150.9742	2	10075.4871	28.6586	0.0500
47	M	90.037	97.264	106.093	97.425	WITHIN GROUPS	368796.0932	1049	351.5692		
	SD	18.992	18.893	17.759	19.237	TOTAL	388947.0675	1051			
	N	183	832	169	1184	BETWEEN GROUPS	1451.5912	2	725.7956	28.3726	0.0442
48	M	10.344	12.155	14.402	12.196	WITHIN GROUPS	30210.9493	1181	25.5808		
	SD	4.586	5.107	5.296	5.173	TOTAL	31662.5405	1183			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: WHITE FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	177	828	166	1171	BETWEEN GROUPS	1778.6075	2	889.3037	30.4695	0.0479
49	M	10.480	12.830	15.030	12.787	WITHIN GROUPS	34090.0193	1168	29.1867		
	SD	5.067	5.482	5.350	5.537	TOTAL	35868.6268	1170			
	N	179	830	168	1177	BETWEEN GROUPS	1169.2541	2	584.6271	26.0537	0.0408
50	M	13.263	14.901	16.929	14.941	WITHIN GROUPS	26343.7009	1174	22.4393		
	SD	4.364	4.635	5.552	4.837	TOTAL	27512.9550	1176			
	N	181	826	166	1173	BETWEEN GROUPS	476.2745	2	238.1373	7.5839	0.0111
51	M	11.840	13.045	14.181	13.020	WITHIN GROUPS	36738.2745	1170	31.4002		
	SD	5.406	5.587	5.889	5.635	TOTAL	37214.5490	1172			
	N	180	819	169	1168	BETWEEN GROUPS	1562.9000	2	781.4500	31.0126	0.0489
52	M	11.783	13.822	16.018	13.825	WITHIN GROUPS	29355.4699	1165	25.1978		
	SD	4.686	4.967	5.585	5.147	TOTAL	30918.3699	1167			
	N	181	830	164	1175	BETWEEN GROUPS	1804.3501	2	902.1751	31.9238	0.0500
53	M	10.552	12.349	15.091	12.455	WITHIN GROUPS	33121.0541	1172	28.2603		
	SD	4.908	5.401	5.313	5.454	TOTAL	34925.4043	1174			
	N	182	822	165	1169	BETWEEN GROUPS	2060.3257	2	1030.1629	36.7357	0.0576
54	M	10.544	13.055	15.412	12.997	WITHIN GROUPS	32697.6606	1166	28.0426		
	SD	4.960	5.318	5.518	5.455	TOTAL	34757.9863	1168			
	N	184	820	168	1172	BETWEEN GROUPS	2047.1070	2	1023.5535	38.3096	0.0599
55	M	11.940	14.204	16.768	14.216	WITHIN GROUPS	31233.2778	1169	26.7179		
	SD	5.187	5.124	5.365	5.331	TOTAL	33280.3848	1171			
	N	181	818	164	1163	BETWEEN GROUPS	1939.0737	2	969.5369	31.8436	0.0504
56	M	12.171	14.240	16.909	14.294	WITHIN GROUPS	35318.3553	1160	30.4469		
	SD	5.005	5.512	6.059	5.662	TOTAL	37257.4291	1162			
	N	240	1116	244	1600	BETWEEN GROUPS	85906.5942	2	42953.2971	2031.4547	0.7174
57	M	86.892	99.901	113.529	100.028	WITHIN GROUPS	33767.1402	1597	21.1441		
	SD	4.898	4.537	4.573	8.651	TOTAL	119673.7344	1599			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 0 WITH RANGE OF 0.0 TO 0.0

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE 0.0 , 0.0 , 0.0 , -9.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 1.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 296 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	27	168	36	231	BETWEEN GROUPS	282.4860	2	141.2430	1.0731	0.0006
1	M	144.815	145.935	148.667	146.229	WITHIN GROUPS	30010.3538	228	131.6244		
	SD	11.156	11.424	11.926	11.476	TOTAL	30292.8398	230			
	N	23	158	32	213	BETWEEN GROUPS	1.7850	2	0.8925	0.6690	-0.0031
2	M	5.565	5.297	5.219	5.315	WITHIN GROUPS	280.1399	210	1.3340		
	SD	0.843	1.181	1.211	1.153	TOTAL	281.9249	212			
	N	26	157	34	217	BETWEEN GROUPS	0.0636	2	0.0318	0.0222	-0.0091
3	M	5.077	5.076	5.029	5.069	WITHIN GROUPS	305.8995	214	1.4294		
	SD	1.017	1.217	1.218	1.190	TOTAL	305.9631	216			
	N	27	168	36	231	BETWEEN GROUPS	3.3074	2	1.6537	0.2204	-0.0068
4	M	4.407	4.720	4.861	4.706	WITHIN GROUPS	1710.6753	228	7.5030		
	SD	2.693	2.716	2.880	2.730	TOTAL	1713.9827	230			
	N	25	158	34	217	BETWEEN GROUPS	1.4950	2	0.7475	0.5623	-0.0041
5	M	5.720	5.975	5.882	5.931	WITHIN GROUPS	284.4681	214	1.3293		
	SD	0.843	1.167	1.274	1.151	TOTAL	285.9631	216			
	N	25	159	35	219	BETWEEN GROUPS	0.4977	2	0.2488	0.4549	-0.0050
6	M	4.480	4.503	4.371	4.479	WITHIN GROUPS	118.1599	216	0.5470		
	SD	0.586	0.762	0.731	0.738	TOTAL	118.6575	218			
	N	27	160	35	222	BETWEEN GROUPS	592.0375	2	296.0187	12.7272	0.0956
7	M	15.000	17.062	20.857	17.410	WITHIN GROUPS	5093.6607	219	23.2587		
	SD	4.385	4.671	5.750	5.072	TOTAL	5685.6982	221			
	N	27	168	36	231	BETWEEN GROUPS	96.4672	2	48.2336	0.1952	-0.0070
8	M	87.037	85.077	85.833	85.424	WITHIN GROUPS	56329.9570	228	247.0612		
	SD	12.744	15.569	18.226	15.663	TOTAL	56426.4242	230			
	N	19	118	26	163	BETWEEN GROUPS	4.2047	2	2.1023	0.8803	-0.0015
9	M	2.842	2.712	3.154	2.798	WITHIN GROUPS	382.1143	160	2.3882		
	SD	1.772	1.536	1.405	1.544	TOTAL	386.3190	162			
	N	23	123	25	171	BETWEEN GROUPS	1.7031	2	0.8515	0.3435	-0.0077
10	M	2.565	2.675	2.920	2.696	WITHIN GROUPS	416.4840	168	2.4791		
	SD	1.409	1.627	1.441	1.568	TOTAL	418.1871	170			
	N	24	135	28	187	BETWEEN GROUPS	1.5548	2	0.7774	0.4177	-0.0063
11	M	2.917	2.711	2.571	2.717	WITHIN GROUPS	342.4238	184	1.8610		
	SD	1.349	1.381	1.289	1.360	TOTAL	343.9786	186			
	N	23	145	29	197	BETWEEN GROUPS	6.6457	2	3.3229	1.3281	0.0033
12	M	2.913	2.469	2.862	2.579	WITHIN GROUPS	485.3847	194	2.5020		
	SD	2.021	1.500	1.597	1.584	TOTAL	492.0305	196			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	18	99	21	138	BETWEEN GROUPS	385.0380	2	192.5190	2.8375	0.0259
13	M	28.333	31.444	34.619	31.522	WITHIN GROUPS	9159.3968	135	67.8474		
	SD	7.926	8.407	7.632	8.347	TOTAL	9544.4348	137			
	N	22	143	33	198	BETWEEN GROUPS	10157.1861	2	5078.5930	44.6524	0.3860
14	M	29.909	39.678	55.788	41.278	WITHIN GROUPS	22178.5361	195	113.7361		
	SD	8.257	10.265	13.446	12.812	TOTAL	32335.7222	197			
	N	22	149	30	201	BETWEEN GROUPS	0.4057	2	0.2029	0.8166	-0.0018
15	M	2.455	2.557	2.633	2.557	WITHIN GROUPS	49.1863	198	0.2484		
	SD	0.510	0.498	0.490	0.498	TOTAL	49.5920	200			
	N	22	143	33	198	BETWEEN GROUPS	6413.7141	2	3206.8570	41.8878	0.2923
16	M	40.000	48.811	61.030	49.869	WITHIN GROUPS	14928.8718	195	76.5583		
	SD	7.165	8.391	10.973	10.409	TOTAL	21342.5859	197			
	N	15	105	23	143	BETWEEN GROUPS	1051.2012	2	525.6006	2.2645	0.0174
17	M	86.200	95.010	92.609	93.699	WITHIN GROUPS	32494.8687	140	232.1062		
	SD	16.971	15.168	14.358	15.370	TOTAL	33546.0699	142			
	N	27	168	36	231	BETWEEN GROUPS	11399.0278	2	5699.5139	72.8144	0.3834
18	M	31.667	43.214	58.139	44.190	WITHIN GROUPS	17846.5913	228	78.2745		
	SD	6.923	8.762	10.393	11.276	TOTAL	29245.6190	230			
	N	27	167	36	230	BETWEEN GROUPS	1413.1069	2	706.5534	12.8431	0.0934
19	M	48.407	51.503	57.333	52.052	WITHIN GROUPS	12488.2670	227	55.0144		
	SD	6.091	7.277	8.838	7.791	TOTAL	13901.3739	229			
	N	27	165	36	228	BETWEEN GROUPS	2186.8898	2	1093.4449	15.9707	0.1161
20	M	45.889	49.636	56.944	50.346	WITHIN GROUPS	15404.7374	225	68.4655		
	SD	8.382	8.210	8.492	8.803	TOTAL	17591.6272	227			
	N	24	157	33	214	BETWEEN GROUPS	307.2165	2	153.6083	3.3061	0.0211
21	M	22.292	24.261	26.848	24.439	WITHIN GROUPS	9803.4938	211	46.4621		
	SD	5.179	6.839	7.686	6.890	TOTAL	10110.7103	213			
	N	24	157	33	214	BETWEEN GROUPS	341.4382	2	170.7191	3.5610	0.0234
22	M	22.250	24.261	27.030	24.463	WITHIN GROUPS	10115.7627	211	47.9420		
	SD	5.244	6.972	7.707	7.007	TOTAL	10457.2009	213			
	N	21	142	30	193	BETWEEN GROUPS	326.5337	2	163.2668	2.9118	0.0194
23	M	21.524	23.915	26.567	24.067	WITHIN GROUPS	10653.5907	190	56.0715		
	SD	6.226	7.445	8.435	7.562	TOTAL	10980.1244	192			
	N	24	157	33	214	BETWEEN GROUPS	353.6838	2	176.8419	3.3041	0.0211
24	M	20.750	23.510	25.788	23.551	WITHIN GROUPS	11293.2508	211	53.5225		
	SD	6.879	7.108	8.521	7.395	TOTAL	11646.9346	213			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	1	27	10	38	BETWEEN GROUPS	239.0491	2	119.5246	1.5376	0.0275
25	M	30.000	25.111	30.700	26.711	WITHIN GROUPS	2720.7667	35	77.7362		
	SD	0.0	7.982	10.874	8.944	TOTAL	2959.8158	37			
	N	24	155	33	212	BETWEEN GROUPS	244.7762	2	122.3881	3.8668	0.0263
26	M	29.792	31.439	33.818	31.623	WITHIN GROUPS	6615.0352	209	31.6509		
	SD	4.934	5.787	5.294	5.702	TOTAL	6859.8113	211			
	N	1	22	8	31	BETWEEN GROUPS	49.5605	2	24.7802	0.5063	-0.0329
27	M	20.000	25.500	27.125	25.742	WITHIN GROUPS	1370.3750	28	48.9420		
	SD	0.0	6.682	7.864	6.880	TOTAL	1419.9355	30			
	N	24	157	33	214	BETWEEN GROUPS	695.0329	2	347.5164	4.7701	0.0340
28	M	24.708	28.459	31.758	28.547	WITHIN GROUPS	15371.9998	211	72.8531		
	SD	8.809	8.196	9.855	8.685	TOTAL	16067.0327	213			
	N	23	156	33	212	BETWEEN GROUPS	149.1942	2	74.5971	1.2868	0.0027
29	M	28.609	30.359	31.909	30.410	WITHIN GROUPS	12116.1030	209	57.9718		
	SD	8.452	7.425	7.903	7.624	TOTAL	12265.2972	211			
	N	24	156	33	213	BETWEEN GROUPS	381.4796	2	190.7398	2.6774	0.0155
30	M	28.917	30.686	33.818	30.972	WITHIN GROUPS	14960.3514	210	71.2398		
	SD	8.642	8.293	8.984	8.507	TOTAL	15341.8310	212			
	N	23	158	33	214	BETWEEN GROUPS	649.0279	2	324.5139	4.9738	0.0358
31	M	24.217	26.918	30.818	27.229	WITHIN GROUPS	13766.7525	211	65.2453		
	SD	6.179	8.080	9.146	8.227	TOTAL	14415.7804	213			
	N	24	146	31	201	BETWEEN GROUPS	1053.7359	2	526.8679	7.8860	0.0641
32	M	21.250	25.233	29.935	25.483	WITHIN GROUPS	13228.4532	198	66.8104		
	SD	8.274	7.713	10.046	8.450	TOTAL	14282.1891	200			
	N	16	126	29	171	BETWEEN GROUPS	257.6139	2	128.8069	2.0947	0.0126
33	M	22.875	24.833	27.517	25.105	WITHIN GROUPS	10330.4914	168	61.4910		
	SD	6.076	7.789	8.850	7.892	TOTAL	10588.1053	170			
	N	12	111	25	148	BETWEEN GROUPS	229.8459	2	114.9229	2.3736	0.0182
34	M	22.583	25.099	27.640	25.324	WITHIN GROUPS	7020.5866	145	48.4178		
	SD	5.632	6.625	8.765	7.023	TOTAL	7250.4324	147			
	N	11	96	21	128	BETWEEN GROUPS	64.8335	2	32.4167	0.6068	-0.0062
35	M	26.909	26.490	28.429	26.844	WITHIN GROUPS	6678.0415	125	53.4243		
	SD	6.204	7.442	7.180	7.287	TOTAL	6742.8750	127			
	N	9	81	19	109	BETWEEN GROUPS	132.1849	2	66.0925	1.7215	0.0131
36	M	25.444	26.753	29.368	27.101	WITHIN GROUPS	4069.7050	106	38.3934		
	SD	3.395	6.522	5.649	6.237	TOTAL	4201.8899	108			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL
37	N	23	141	32	196
	M	78.739	81.723	87.406	82.301
	SD	10.984	11.040	12.059	11.516
38	N	11	103	21	135
	M	82.364	85.913	90.952	86.407
	SD	10.966	10.781	14.126	11.489
39	N	8	72	18	98
	M	4.000	3.014	3.111	3.112
	SD	1.195	1.399	1.568	1.428
40	N	18	129	24	171
	M	41.500	44.256	52.083	45.064
	SD	8.719	11.058	12.165	11.335
41	N	21	131	26	178
	M	43.619	46.916	57.923	48.135
	SD	9.244	11.007	15.541	12.261
42	N	17	109	24	150
	M	36.294	40.284	46.958	40.900
	SD	11.268	12.974	15.216	13.416
43	N	20	129	23	172
	M	49.350	51.434	57.174	51.959
	SD	8.549	9.100	12.164	9.685
44	N	17	122	23	162
	M	43.471	45.270	53.130	46.198
	SD	7.811	8.080	11.303	8.994
45	N	4	24	9	37
	M	55.250	57.625	67.111	59.676
	SD	15.714	18.731	19.297	18.609
46	N	4	24	9	37
	M	58.500	55.792	74.889	60.730
	SD	5.972	14.219	18.990	16.709
47	N	4	24	9	37
	M	57.000	56.875	70.778	60.270
	SD	9.695	14.504	17.838	15.793
48	N	14	113	27	154
	M	7.071	7.283	8.667	7.506
	SD	4.514	3.577	4.297	3.811

SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
BETWEEN GROUPS	1172.8735	2	586.4367	4.5848	0.0353
WITHIN GROUPS	24686.3663	193	127.9086		
TOTAL	25859.2398	195			
BETWEEN GROUPS	638.8812	2	319.4406	2.4731	0.0214
WITHIN GROUPS	17049.7114	132	129.1645		
TOTAL	17688.5926	134			
BETWEEN GROUPS	7.0014	2	3.5007	1.7433	0.0149
WITHIN GROUPS	190.7639	95	2.0080		
TOTAL	197.7653	97			
BETWEEN GROUPS	1495.4009	2	747.7005	6.1736	0.0571
WITHIN GROUPS	20346.8915	168	121.1124		
TOTAL	21842.2924	170			
BETWEEN GROUPS	3113.8892	2	1556.9446	11.5958	0.1064
WITHIN GROUPS	23496.8749	175	134.2679		
TOTAL	26610.7640	177			
BETWEEN GROUPS	1282.8288	2	641.4144	3.6923	0.0347
WITHIN GROUPS	25536.6712	147	173.7189		
TOTAL	26819.5000	149			
BETWEEN GROUPS	797.1708	2	398.5854	4.4190	0.0382
WITHIN GROUPS	15243.5443	169	90.1985		
TOTAL	16040.7151	171			
BETWEEN GROUPS	1336.7613	2	668.3806	9.0933	0.0908
WITHIN GROUPS	11686.9178	159	73.5026		
TOTAL	13023.6790	161			
BETWEEN GROUPS	676.8442	2	338.4221	0.9760	-0.0013
WITHIN GROUPS	11789.2639	34	346.7431		
TOTAL	12466.1081	36			
BETWEEN GROUPS	2409.4501	2	1204.7250	5.3600	0.1907
WITHIN GROUPS	7641.8472	34	224.7602		
TOTAL	10051.2973	36			
BETWEEN GROUPS	1313.1167	2	656.5584	2.9119	0.0937
WITHIN GROUPS	7666.1806	34	225.4759		
TOTAL	8979.2973	36			
BETWEEN GROUPS	44.6269	2	22.3134	1.5471	0.0071
WITHIN GROUPS	2177.8666	151	14.4230		
TOTAL	2222.4935	153			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO MALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	15	119	28	162	BETWEEN GROUPS	175.9836	2	87.9918	5.8761	0.0568
49	M	4.800	7.193	9.000	7.284	WITHIN GROUPS	2380.9546	159	14.9746		
	SD	3.212	3.882	4.119	3.985	TOTAL	2556.9383	161			
	N	15	119	29	163	BETWEEN GROUPS	120.6266	2	60.3133	3.9683	0.0351
50	M	6.333	7.076	9.172	7.380	WITHIN GROUPS	2431.7906	160	15.1987		
	SD	2.582	3.902	4.400	3.969	TOTAL	2552.4172	162			
	N	16	119	28	163	BETWEEN GROUPS	3.1280	2	1.5640	0.1289	-0.0108
51	M	6.562	6.857	6.536	6.773	WITHIN GROUPS	1941.4732	160	12.1342		
	SD	3.741	3.518	3.168	3.465	TOTAL	1944.6012	162			
	N	15	119	27	161	BETWEEN GROUPS	131.6487	2	65.8244	7.8756	0.0787
52	M	5.200	7.454	8.889	7.484	WITHIN GROUPS	1320.5625	158	8.3580		
	SD	2.651	2.825	3.286	3.013	TOTAL	1452.2112	160			
	N	15	119	27	161	BETWEEN GROUPS	72.1305	2	36.0653	2.1598	0.0142
53	M	5.533	6.983	8.222	7.056	WITHIN GROUPS	2638.3664	158	16.6985		
	SD	4.291	4.030	4.228	4.116	TOTAL	2710.4969	160			
	N	16	115	27	158	BETWEEN GROUPS	87.0083	2	43.5041	3.9120	0.0356
54	M	4.500	4.826	6.741	5.120	WITHIN GROUPS	1723.7069	155	11.1207		
	SD	2.852	3.207	4.063	3.396	TOTAL	1810.7152	157			
	N	16	114	29	159	BETWEEN GROUPS	154.3176	2	77.1588	5.9801	0.0590
55	M	4.375	6.544	8.207	6.629	WITHIN GROUPS	2012.7893	156	12.9025		
	SD	2.895	3.555	4.048	3.703	TOTAL	2167.1069	158			
	N	16	109	26	151	BETWEEN GROUPS	2.5052	2	1.2526	0.1062	-0.0120
56	M	6.437	6.312	6.654	6.384	WITHIN GROUPS	1745.2166	148	11.7920		
	SD	3.705	3.352	3.610	3.413	TOTAL	1747.7219	150			
	N	27	168	36	231	BETWEEN GROUPS	11768.5239	2	5884.2619	263.4124	0.6944
57	M	87.074	99.542	114.194	100.368	WITHIN GROUPS	5093.1991	228	22.3386		
	SD	5.188	4.227	6.346	8.562	TOTAL	16861.7229	230			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

NO OF VARIABLES = 57 CLASSIFICATION VAR = # 57 WITH ELIMINATION CODE FOR CLAS. VAR = 999.000

CLAS CATEGORY UPPER LIMITS = 91.000, 108.000, 990.000, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,

RESTRICTION VAR = # 0 WITH RANGE OF 0.0 TO 0.0

CODES TO BE EXCLUDED FOR VARS 1 TO 57 ARE 0.0 , 0.0 , 0.0 , -9.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 1.000, 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,
0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 999.000,

FORMAT OF DATA IS (57F6.0)

MAX # OF OBS TO BE INCLUDED THIS PROBLEM = 259 DATA TO BE READ FROM TAPE WITHOUT REWIND

GROUP 1 = UNDERACHIEVERS

GROUP 2 = AVERAGE ACHIEVERS

GROUP 3 = OVERACHIEVERS

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	21	148	27	196	BETWEEN GROUPS	337.4675	2	168.7338	1.5243	0.0053
1	M	144.762	142.264	145.667	143.000	WITHIN GROUPS	21364.5325	193	110.6971		
	SD	14.872	9.533	11.738	10.550	TOTAL	21702.0000	195			
	N	19	139	26	184	BETWEEN GROUPS	6.7276	2	3.3638	2.2154	0.0130
2	M	5.316	5.273	4.731	5.201	WITHIN GROUPS	274.8322	181	1.5184		
	SD	1.336	1.122	1.663	1.240	TOTAL	281.5598	183			
	N	21	137	26	184	BETWEEN GROUPS	1.9027	2	0.9513	0.5213	-0.0052
3	M	4.905	4.949	4.654	4.902	WITHIN GROUPS	330.3365	181	1.8251		
	SD	1.338	1.291	1.648	1.347	TOTAL	332.2391	183			
	N	21	148	27	196	BETWEEN GROUPS	7.0312	2	3.5156	0.4356	-0.0058
4	M	4.571	4.628	4.074	4.546	WITHIN GROUPS	1557.5555	193	8.0702		
	SD	2.767	2.834	2.934	2.833	TOTAL	1564.5867	195			
	N	21	137	27	185	BETWEEN GROUPS	7.7432	2	3.8716	2.6771	0.0178
5	M	6.381	6.044	5.593	6.016	WITHIN GROUPS	263.2081	182	1.4462		
	SD	0.973	1.218	1.279	1.213	TOTAL	270.9514	184			
	N	20	136	26	182	BETWEEN GROUPS	3.5724	2	1.7862	3.3347	0.0250
6	M	4.700	4.551	4.192	4.516	WITHIN GROUPS	95.8782	179	0.5356		
	SD	0.571	0.687	1.021	0.741	TOTAL	99.4505	181			
	N	20	143	24	187	BETWEEN GROUPS	358.4311	2	179.2156	5.7973	0.0488
7	M	17.250	19.231	22.708	19.465	WITHIN GROUPS	5688.0929	184	30.9135		
	SD	5.495	5.608	5.312	5.702	TOTAL	6046.5241	186			
	N	21	148	27	196	BETWEEN GROUPS	70.1301	2	35.0650	0.1379	-0.0089
8	M	86.000	87.655	88.370	87.577	WITHIN GROUPS	49067.7220	193	254.2369		
	SD	17.418	14.982	19.614	15.874	TOTAL	49137.8520	195			
	N	18	116	19	153	BETWEEN GROUPS	18.3123	2	9.1562	3.2282	0.0283
9	M	3.667	2.767	3.474	2.961	WITHIN GROUPS	425.4524	150	2.8363		
	SD	2.000	1.540	2.170	1.709	TOTAL	443.7647	152			
	N	18	123	20	161	BETWEEN GROUPS	9.0834	2	4.5417	1.8986	0.0110
10	M	3.278	2.634	3.100	2.764	WITHIN GROUPS	377.9477	158	2.3921		
	SD	1.994	1.444	1.714	1.555	TOTAL	387.0311	160			
	N	19	125	18	162	BETWEEN GROUPS	3.7528	2	1.8764	0.9950	-0.0001
11	M	3.158	2.688	2.833	2.759	WITHIN GROUPS	299.8583	159	1.8859		
	SD	1.068	1.382	1.581	1.373	TOTAL	303.6111	161			
	N	20	128	20	168	BETWEEN GROUPS	19.1507	2	9.5753	5.6027	0.0519
12	M	3.150	2.383	3.200	2.571	WITHIN GROUPS	281.9922	165	1.7090		
	SD	1.040	1.293	1.609	1.343	TOTAL	301.1429	167			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	19	81	9	109	BETWEEN GROUPS	986.5235	2	493.2617	7.6958	0.1094
13	M	29.421	34.765	41.889	34.422	WITHIN GROUPS	6794.0637	106	64.0949		
	SD	7.669	8.190	6.791	8.488	TOTAL	7780.5872	108			
	N	19	123	26	168	BETWEEN GROUPS	10917.2033	2	5458.6016	44.2909	0.3401
14	M	30.000	45.520	61.231	46.196	WITHIN GROUPS	20335.3146	165	123.2443		
	SD	8.981	11.167	12.114	13.680	TOTAL	31252.5179	167			
	N	15	122	17	154	BETWEEN GROUPS	0.5702	2	0.2851	1.1086	0.0014
15	M	2.400	2.607	2.588	2.584	WITHIN GROUPS	38.8324	151	0.2572		
	SD	0.507	0.507	0.507	0.507	TOTAL	39.4026	153			
	N	19	123	26	168	BETWEEN GROUPS	7227.7397	2	3613.8698	37.7133	0.3041
16	M	41.632	53.317	66.808	54.083	WITHIN GROUPS	15811.0937	165	95.8248		
	SD	9.884	8.721	13.819	11.746	TOTAL	23038.8333	167			
	N	13	98	14	125	BETWEEN GROUPS	1104.1688	2	552.0844	2.1278	0.017[illegible]
17	M	86.077	92.316	98.857	92.400	WITHIN GROUPS	31653.8312	122	259.4576		
	SD	16.230	15.482	20.084	16.254	TOTAL	32758.0000	124			
	N	21	148	27	196	BETWEEN GROUPS	9107.0457	2	4553.5229	51.9270	0.3420
18	M	34.952	48.764	62.556	49.184	WITHIN GROUPS	16924.3420	193	87.6909		
	SD	8.840	9.075	11.188	11.554	TOTAL	26031.3878	195			
	N	21	147	26	194	BETWEEN GROUPS	1510.5083	2	755.2542	10.9597	0.0931
19	M	47.714	54.136	59.115	54.108	WITHIN GROUPS	13162.2185	191	68.9121		
	SD	8.421	8.162	8.981	8.719	TOTAL	14672.7268	193			
	N	21	146	27	194	BETWEEN GROUPS	2112.1972	2	1056.0986	13.0661	0.1106
20	M	47.810	56.075	61.111	55.881	WITHIN GROUPS	15438.0760	191	80.8276		
	SD	9.842	8.712	9.799	9.536	TOTAL	17550.2732	193			
	N	18	132	25	175	BETWEEN GROUPS	363.2514	2	181.6257	2.7569	0.0197
21	M	26.389	29.856	32.280	29.846	WITHIN GROUPS	11331.5829	172	65.8813		
	SD	8.190	8.189	7.657	8.198	TOTAL	11694.8343	174			
	N	18	132	25	175	BETWEEN GROUPS	474.6017	2	237.3008	3.4730	0.0275
22	M	26.333	29.886	33.040	29.971	WITHIN GROUPS	11752.2555	172	68.3271		
	SD	8.007	8.328	8.106	8.383	TOTAL	12226.8571	174			
	N	18	125	[illegible]2	165	BETWEEN GROUPS	461.1447	2	230.5724	3.6379	0.0310
23	M	26.000	29.576	3[illegible].818	29.618	WITHIN GROUPS	10267.8007	162	63.3815		
	SD	6.979	8.203	7.222	8.088	TOTAL	10728.9455	164			
	N	18	132	25	175	BETWEEN GROUPS	494.3455	2	247.1727	3.5320	0.0281
24	M	22.500	27.947	28.360	27.446	WITHIN GROUPS	12036.8888	172	69.9819		
	SD	7.602	8.234	9.513	8.486	TOTAL	12531.2343	174			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	4	64	5	73	BETWEEN GROUPS	38.3944	2	19.1972	0.2829	-0.0200
25	M	26.500	29.141	30.600	29.096	WITHIN GROUPS	4749.9344	70	67.8562		
	SD	11.818	8.039	8.050	8.155	TOTAL	4788.3288	72			
	N	18	130	24	172	BETWEEN GROUPS	391.4074	2	195.7037	3.4054	0.0272
26	M	29.278	33.408	35.333	33.244	WITHIN GROUPS	9712.3368	169	57.4694		
	SD	6.763	7.676	7.614	7.687	TOTAL	10103.7442	171			
	N	1	19	9	29	BETWEEN GROUPS	7.7112	2	3.8556	0.0412	-0.0700
27	M	35.000	32.842	32.222	32.724	WITHIN GROUPS	2434.0819	26	93.6185		
	SD	0.0	9.039	10.975	9.338	TOTAL	2441.7931	28			
	N	18	130	25	173	BETWEEN GROUPS	255.1950	2	127.5975	2.1202	0.0128
28	M	31.722	35.177	36.520	35.012	WITHIN GROUPS	10230.7819	170	60.1811		
	SD	7.144	7.925	7.246	7.808	TOTAL	10485.9769	172			
	N	18	130	25	173	BETWEEN GROUPS	41.1804	2	20.5902	0.3576	-0.0075
29	M	33.333	34.946	34.800	34.757	WITHIN GROUPS	9788.6231	170	57.5801		
	SD	7.731	7.421	8.337	7.560	TOTAL	9829.8035	172			
	N	17	128	24	169	BETWEEN GROUPS	436.7625	2	218.3812	2.2410	0.0165
30	M	27.588	31.883	34.167	31.775	WITHIN GROUPS	16176.6932	166	97.4500		
	SD	11.641	9.686	9.540	9.944	TOTAL	16613.4556	168			
	N	18	134	23	175	BETWEEN GROUPS	561.3189	2	280.6595	3.0660	0.0231
31	M	28.111	32.201	35.565	32.223	WITHIN GROUPS	15744.9897	172	91.5406		
	SD	9.815	9.405	10.317	9.681	TOTAL	16306.3086	174			
	N	17	128	22	167	BETWEEN GROUPS	766.5729	2	383.2865	4.0454	0.0352
32	M	25.412	31.344	34.182	31.114	WITHIN GROUPS	15538.2654	164	94.7455		
	SD	9.254	9.503	11.337	9.911	TOTAL	16304.8383	166			
	N	14	123	16	153	BETWEEN GROUPS	523.9084	2	261.9542	2.7810	0.0228
33	M	26.071	29.886	34.375	30.007	WITHIN GROUPS	14129.0851	150	94.1939		
	SD	8.922	9.823	9.387	9.818	TOTAL	14652.9935	152			
	N	11	104	14	129	BETWEEN GROUPS	338.0170	2	169.0085	2.7028	0.0257
34	M	27.636	29.212	34.071	29.605	WITHIN GROUPS	7878.8202	126	62.5303		
	SD	8.778	8.031	5.980	8.012	TOTAL	8216.8372	128			
	N	6	82	13	101	BETWEEN GROUPS	57.9942	2	28.9971	0.5979	-0.0080
35	M	32.500	29.732	31.077	30.069	WITHIN GROUPS	4752.5206	98	48.4951		
	SD	6.058	6.853	7.984	6.936	TOTAL	4810.5149	100			
	N	6	71	11	88	BETWEEN GROUPS	69.0412	2	34.5206	0.8300	-0.0039
36	M	29.833	28.972	31.636	29.364	WITHIN GROUPS	3535.3224	85	41.5920		
	SD	7.055	6.465	6.005	6.437	TOTAL	3604.3636	87			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	16	126	22	164	BETWEEN GROUPS	2046.6374	2	1023.3187	8.0709	0.0796
37	M	79.188	88.032	94.045	87.976	WITHIN GROUPS	20413.2651	161	126.7905		
	SD	11.635	11.316	10.639	11.738	TOTAL	22459.9024	163			
	N	12	99	14	125	BETWEEN GROUPS	855.1423	2	427.5711	4.3652	0.0511
38	M	87.750	89.788	97.643	90.472	WITHIN GROUPS	11950.0097	122	97.9509		
	SD	7.689	10.157	9.564	10.162	TOTAL	12805.1520	124			
	N	6	71	10	87	BETWEEN GROUPS	3.9311	2	1.9656	1.1114	0.0026
39	M	4.167	3.521	4.000	3.621	WITHIN GROUPS	148.5516	84	1.7685		
	SD	1.602	1.361	0.816	1.332	TOTAL	152.4828	86			
	N	13	106	19	138	BETWEEN GROUPS	1372.3761	2	686.1880	6.2267	0.0704
40	M	44.385	49.009	56.789	49.645	WITHIN GROUPS	14877.2254	135	110.2017		
	SD	7.512	10.407	12.533	10.891	TOTAL	16249.6014	137			
	N	14	109	19	142	BETWEEN GROUPS	4297.0589	2	2148.5294	9.0054	0.1013
41	M	46.143	59.982	69.211	59.852	WITHIN GROUPS	33162.8355	139	238.5816		
	SD	14.255	15.751	14.390	16.299	TOTAL	37459.8944	141			
	N	13	95	18	126	BETWEEN GROUPS	1350.2347	2	675.1174	2.2010	0.0187
42	M	42.077	50.084	55.444	50.024	WITHIN GROUPS	37728.6938	123	306.7373		
	SD	19.294	17.025	18.809	17.681	TOTAL	39078.9286	125			
	N	13	104	19	136	BETWEEN GROUPS	283.7200	2	141.8600	1.4430	0.0065
43	M	49.536	54.260	55.000	53.912	WITHIN GROUPS	13075.2212	133	98.3099		
	SD	8.452	9.870	11.015	9.948	TOTAL	13358.9412	135			
	N	13	104	18	135	BETWEEN GROUPS	1071.9405	2	535.9702	5.0545	0.0367
44	M	45.308	52.096	57.222	52.126	WITHIN GROUPS	13996.9188	132	106.0373		
	SD	9.411	10.176	11.553	10.604	TOTAL	15068.8593	134			
	N	3	33	6	42	BETWEEN GROUPS	883.8766	2	441.9383	1.0208	0.0010
45	M	54.000	67.485	75.000	67.595	WITHIN GROUPS	16884.2424	39	432.9293		
	SD	26.907	20.094	22.432	20.818	TOTAL	17768.1190	41			
	N	3	33	6	42	BETWEEN GROUPS	422.6732	2	211.3366	0.6194	-0.0185
46	M	59.333	71.303	72.667	70.643	WITHIN GROUPS	13306.9697	39	341.2044		
	SD	16.862	16.476	28.465	18.299	TOTAL	13729.6429	41			
	N	3	33	6	42	BETWEEN GROUPS	601.5823	2	300.7911	0.9224	-0.0037
47	M	56.667	69.424	73.833	69.143	WITHIN GROUPS	12717.5606	39	326.0913		
	SD	21.008	16.636	24.408	18.024	TOTAL	13319.1429	41			
	N	14	112	16	142	BETWEEN GROUPS	57.5719	2	28.7860	2.7074	0.0235
48	M	6.143	7.321	8.875	7.380	WITHIN GROUPS	1477.8929	139	10.6323		
	SD	3.939	3.214	2.941	3.300	TOTAL	1535.4648	141			

LLOYD 1-14: READING DEFICIENCY ANALYSIS OF VARIANCE RUNS

LLOYD 1-14A: NEGRO FEMALES

J		1	2	3	TOTAL	SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO	OMEGA SQ
	N	14	114	17	145	BETWEEN GROUPS	56.5455	2	28.2727	2.1021	0.0150
49	M	4.929	7.044	6.588	6.786	WITHIN GROUPS	1909.8269	142	13.4495		
	SD	2.786	3.799	3.337	3.695	TOTAL	1966.3724	144			
	N	14	114	17	145	BETWEEN GROUPS	182.9988	2	91.4994	5.8792	0.0631
50	M	8.000	9.851	12.706	10.007	WITHIN GROUPS	2209.9943	142	15.5633		
	SD	4.188	3.745	4.985	4.077	TOTAL	2392.9931	144			
	N	14	111	17	142	BETWEEN GROUPS	53.1749	2	26.5875	2.2010	0.0166
51	M	4.429	6.459	6.588	6.275	WITHIN GROUPS	1679.1138	139	12.0800		
	SD	1.910	3.474	4.360	3.505	TOTAL	1732.2887	141			
	N	14	111	17	142	BETWEEN GROUPS	154.3279	2	77.1639	6.5335	0.0723
52	M	7.714	8.396	11.471	8.697	WITHIN GROUPS	1641.6510	139	11.8104		
	SD	2.644	3.501	3.555	3.569	TOTAL	1795.9789	141			
	N	14	111	17	142	BETWEEN GROUPS	48.0589	2	24.0294	1.4629	0.0065
53	M	5.571	6.784	8.059	6.817	WITHIN GROUPS	2283.1806	139	16.4258		
	SD	3.877	3.834	5.425	4.066	TOTAL	2331.2394	141			
	N	14	112	17	143	BETWEEN GROUPS	226.2582	2	113.1291	8.4227	0.0941
54	M	4.500	6.821	9.824	6.951	WITHIN GROUPS	1880.3992	140	13.4314		
	SD	3.107	3.605	4.419	3.852	TOTAL	2106.6573	142			
	N	14	108	17	139	BETWEEN GROUPS	99.0165	2	49.5082	4.0625	0.0422
55	M	7.357	7.574	10.118	7.863	WITHIN GROUPS	1657.3864	136	12.1867		
	SD	3.342	3.531	3.333	3.568	TOTAL	1756.4029	138			
	N	13	108	17	138	BETWEEN GROUPS	163.5513	2	81.7756	5.8179	0.0653
56	M	6.846	7.861	10.941	8.145	WITHIN GROUPS	1897.5502	135	14.0559		
	SD	3.484	3.665	4.437	3.879	TOTAL	2061.1014	137			
	N	21	148	27	196	BETWEEN GROUPS	8289.6654	2	4144.8327	248.4181	0.7163
57	M	86.619	99.446	112.889	99.923	WITHIN GROUPS	3220.1866	193	16.6849		
	SD	4.153	4.180	3.434	7.683	TOTAL	11509.8520	195			